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June 1997

CHINA

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CHINA

Situation and Outlook Series

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Summary

Record 1996 Grain Crops, Grain Imports Down

U.S. agricultural exports to China for 1996 totaled \$2.1 billion, down from \$2.6 billion in 1995 because of smaller shipments of wheat and corn. For the past few years, China's agricultural trade continues to be characterized by exports of processed and high-value products and imports of more land-intensive and semi-processed goods. In 1996, China continued to be a net grain importer.

China's economy grew 9.7 percent in 1996 compared with 10.2 percent a year earlier. Authorities succeeded in limiting inflation during the year to 6.1 percent. For 1997, economic growth likely will be above 10 percent because credit restrictions were eased in the last half of 1996 and early 1997.

China's leaders are hopeful that total grain output for 1997 will match the record 490 million tons in 1996. In 1996, farmers reaped record wheat, rice, and corn crops because of higher area sown to grain crops, heavier input use, and increases in government purchase prices for grains. Market prices for grains fell in the last half of 1996 and early 1997, and farmers likely have shifted some area out of rice and corn into soybeans, fruits, and vegetables. However, the exception is wheat, where area is up, and output likely will be a record. Net grain imports in 1997 will be below the 9.6 million tons imported in 1996 because of China's record crops in 1995 and 1996.

Rice imports for calendar 1997 will include lower quality rice for poorer urban residents and higher quality Thai rice for higher income residents and are projected at 800,000 tons. Wheat imports are projected at 3.5 million tons, slightly above forecast imports for 1996/97 but down sharply from 12.1 million tons in 1995/96. Corn imports in 1997/98 are projected to be the same as a year earlier's forecast 50,000 tons.

Rice marketing in south China is changing as private rice merchants are beginning to displace the government-controlled rice marketing system. Private rice traders have become more active because economic reforms allowed for competition. Newly installed telephone networks give traders a communication tool to make milled rice contracts with merchants in urban areas and to make purchase contracts with farmers. These merchants are using newly available diesel trucks to efficiently transport rice from farm to mill and then from mill to urban markets. On-farm rice stock holding is also a key element in private rice marketing.

Total oilseed output for 1996 fell to 40.9 million tons, down 5.8 percent from a year earlier. Demand for edible

oil outstripped supplies, and imports totaled 3.4 million tons in 1996/97, up from 2.8 million tons a year earlier. China's oilseed meal imports are projected to total 3.1 million tons in 1996/97, up from 1.6 million tons a year earlier.

Cotton imports fell 18 percent in 1996 to an estimated 697,000 tons for August/July 1996/97. Domestic production for 1996/97 fell nearly 12 percent to 4.2 million tons. In 1997, sown area and output are expected to be lower than in 1996 because of relatively low incentives for cotton producers and because area sown to wheat increased.

In late 1994 and early 1995, China's leaders implemented the "governor's "grain bag" responsibility system" which was designed to increase China's grain self-sufficiency. Various policy instruments were employed to boost grain output in 1995 and 1996, and grain imports were reduced substantially in both years. But the decrease in grain imports was also accompanied by increases in imports of edible oil and chemical fertilizer. The policy arrests China's trend toward specialization and use of international markets.

China's horticultural economy is based on a wide diversity of crop-growing regions and a large labor force. Horticultural output has risen rapidly in the last decade to supply domestic consumers with an increasing array of products. Horticultural exports have increased substantially in this decade, and currently China is one of the world's largest horticultural exporting nations. In most years, horticultural exports more than balance the value of China's grain imports. In 1996, U.S. horticultural exports to China topped \$16 million; U.S. horticultural imports from China in the same year totaled US\$295 million.

China's institutional framework for delivering supplies, such as chemical fertilizer, pesticide, and plastic sheeting is complex. Government institutions continue to play an important role, but open markets are becoming increasingly important. Government and market institutions have the capacity to supply farmers with required input supplies for 1997.

On July 1, 1997, China regains sovereignty over Hong Kong, but the Basic Law provides that Hong Kong will retain its commercial autonomy and will remain a free port with very few tariffs. The structure of Hong Kong's agricultural trade is much different from that of China. Whereas most of China's imports are bulk and intermediate products, Hong Kong's imports are primarily consumer-ready products.

China Controlled Inflation in 1996

China's Government succeeded in reducing inflation to single-digit levels in 1996 while maintaining one of the fastest GDP growth rates of any major economy. With weak external demand, domestic demand led economic growth last year. However, China's foreign exchange reserves continued to increase; the trade surplus with the United States widened, and imports from the European Union and Japan fell, while exports to these two regions increased. As the austerity measures used to reduce inflation aggravated problems in the state sector, the country's state-owned enterprises in 1996 registered their poorest performance since 1949 with nearly half losing money. The strategic position of the large- or medium-sized state-owned enterprises in China—providing urban employment and contributing government revenue through taxes—are two of the main reasons the government is cautious in reforming this sector. [Xinshen Diao, (202) 219-0690]

China's Government succeeded in reducing both growth and inflation to single-digit levels in 1996. Gross Domestic Product (GDP) increased by 9.7 percent in 1996, a lower rate than those of former years, but still one of the fastest growth rates of any major economy. Central government leaders over the past 3 years have made progress in dampening inflation caused by dramatic economic expansion. The officially announced inflation rate (measured by retail prices) was 6.1 percent in 1996. It was the first time since 1991 that China's annual inflation rate fell to a single-digit number and lower than the GDP growth rate.

Domestic demand led economic growth last year, but external demand was weak. In contrast with the stunning gains in the export sector during the previous 2 years, China's exports only grew by 1.5 percent to \$151 billion in 1996. Imports grew by 5.1 percent and reached \$139 billion in 1996. The slowdown in import growth reflected reduced demand for some commodities as well as government-mandated restrictions over some types of imports. Although exports grew slower than imports, China still ran a \$12.3 billion foreign trade surplus in 1996, which was the third consecutive year for China to have an external trade surplus. China's foreign exchange reserves reached \$105 billion at the end of 1996, \$31.4 billion more than at the beginning of the year.

Improvement in Macroeconomic Performance

Over the past 3 years, inflation has been the most pressing macroeconomic issue for China's top leaders. Accordingly, the government tightened credit and fixed investment spending in 1995. By mid-1996, the growth in the retail price index, the most often quoted number for inflation, dropped from double-digit levels to 7.1 percent.

Although the government succeeded in engineering a "soft landing" for the economy by mid-1996, the fiscal and monetary austerity measures exacerbated the financial difficulties of the state industrial sector. Having achieved a "soft landing" and prompted by growing problems in the state industrial sector, in mid-1996 the central government decided to cut interest rates and bank deposit and lending

rates, gradually loosen credit restrictions, and increase working capital loans. These three policies signaled a broader credit easing and stimulated a modest rebound in fixed capital investment during the second half of 1996. Annual fixed investment rose by 18.2 percent in 1996, slightly higher than 1995.

Compared with other countries in the world, China has high rates of investment. In 1996, its fixed investment with respect to GDP was about 35 percent, while the world average rate was around 20 percent. Also, China's household savings with respect to their incomes were quite high. In 1996, China's urban and rural resident domestic savings deposits increased by 30 percent, equivalent to 13 percent of gross domestic products (figure 1).

Growth of government revenues was faster than the growth of the expenditures by 2 percentage points in 1996. The tax reforms introduced in 1994 are beginning to yield greater benefits to Beijing, and half of the state revenues were generated by consumer and value-added tax receipts. The government deficit was 54.8 billion renminbi (RMB) yuan in

Figure 1
Changes in China's personal savings deposits

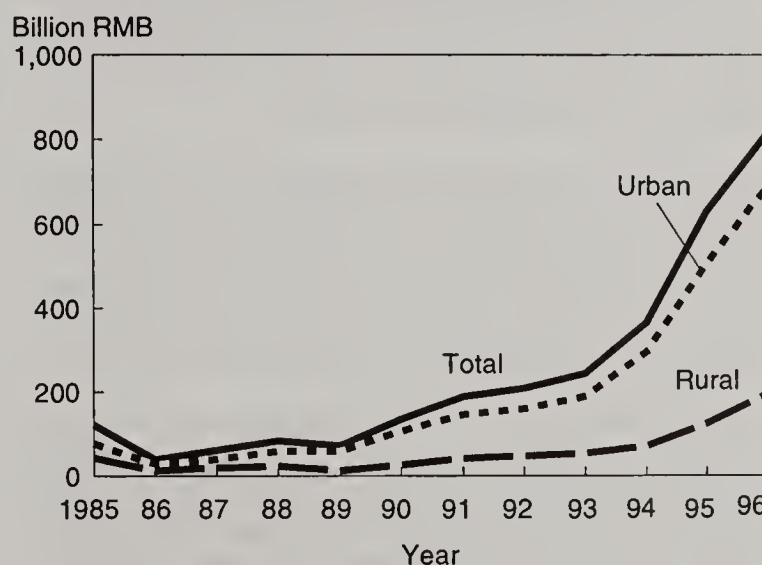


Table 1--China's macroeconomic indicators, 1995-96

Indicator	Units	1995	1996
Population	millions	1,211.2	1,223.9
GDP growth	percent	10.2	9.7
GDP 1/	US\$ billion	657.8	816.8
Change in CPI	percent	14.8	6.1
Currency in circulation	US\$ billion	95.0	106.0
Total state revenue	RMB billion	624.2	736.6
Total state expenditure	RMB billion	682.4	791.4
State budget deficit	RMB billion	58.2	54.8
Fixed asset investment	US\$ billion	241.0	285.0
Exports	US\$ billion	148.8	151.1
Imports	US\$ billion	132.1	138.8

1/ GDP is in current prices.

Sources: China Statistical Yearbook, 1996; China Monthly Statistics, Dec. 1996 and Jan. 1997.

1996, smaller than in 1995. The U.S. dollar/RMB exchange rate in 1996 was 8.3 which was the same as the previous year.

Enlarging Trade Surplus with Major Trade Partners

While China's total imports rose more than its exports, its exports to the three major trade partners grew faster than its imports from these economies in 1996. China widened its trade surplus with the United States, reduced its imports from the European Union (EU) and Japan, and increased its exports to these two regions in 1996. Japan remained China's largest trade partner for the fourth consecutive year. Sino-Japan bilateral trade volume hit a record \$60 billion, or 20.7 percent of China's external trade in 1996. China shipped \$30.9 billion worth of commodities to Japan in 1996, up 8.4 percent from 1995, while its imports from Japan amounted to \$29.2 billion, almost the same as in 1995. Fast growth in export and stagnant imports resulted in a small surplus in Sino-Japan trade, which was the first time in the last 5 years that China imported less from Japan than it exported to Japan.

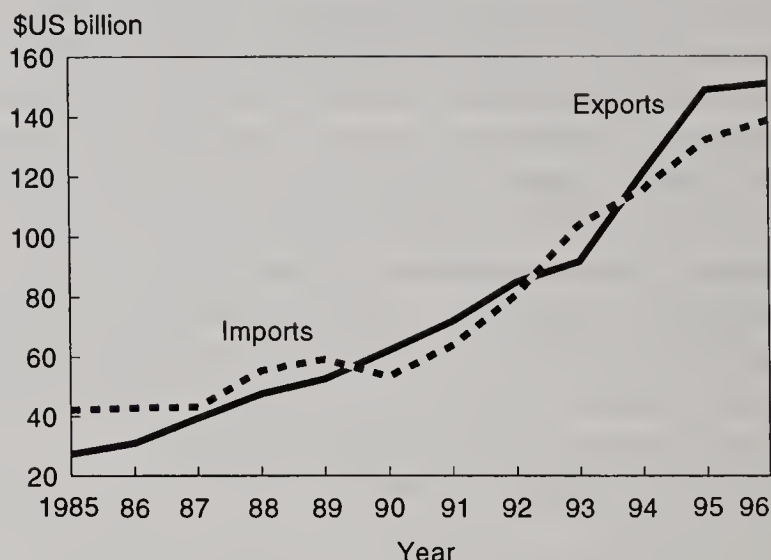
As Sino-Hong Kong trade slipped in 1996, the United States became China's second largest trade partner. In 1996, Sino-U.S. trade reached \$63.5 billion according to U.S. Census trade statistics, while the U.S. trade deficit with China widened to \$39.5 billion. The fast growth in China's exports to the United States, plus stagnant China imports from the United States, are main reasons for the widening U.S.-Sino trade deficit in 1996.

Sino-EU trade kept almost at the same level of 1995's \$40 billion. While EU-bound China exports rose by 3.6 percent from 1995 to \$19.83 billion, imports from the EU fell by 6.5 percent to \$19.87 billion in 1996. By reducing its imports, China balanced its trade with the EU in 1996. In 1995, China had a \$2-billion trade deficit with the EU.

Foreign investment in China's enterprises continued to be a key driver in China's external trade. China sharply cut its tax rebates on exports in 1996, the second reduction in the last 2 years, which hurt some foreign firms working there. But those firms in processing trade got a boost from new tax exemptions on imported materials for processing and

Figure 2

China's total exports and imports



assembling. Exports of joint-venture enterprises surged by 31 percent and reached \$61 billion, while imports by these enterprises increased by 20 percent and reached \$76 billion in 1996. It is the first time that China's processing trade, i.e., trade involving items imported by joint-venture enterprises for some work or assembly and then re-exported with value added, exceeded its general trade category and accounted for slightly more than half of China's total foreign trade in 1996.

In 1996, China announced that under the "current account" its currency, RMB, is fully convertible. This allows anyone doing business with China, or within it, to covert domestic earnings into foreign exchange or vice versa. The currency is not fully convertible under the "capital account."

Growth by Sector

The value of China's industrial output increased by 15 percent in 1996, down 5 percentage points from the growth rate of 1995, the lowest since 1992. The national industrial value-added figure reached \$344.3 billion in 1996, an increase of 12.7 percent in real terms from the previous year. While one-third of industrial output is still from state-owned enterprises, growth of state-owned enterprises' production was much slower than those of the other types of firms. Growth of output from state-owned enterprises was 6.7 percent, whereas output from collectively owned enterprises increased by 23.6 percent, and increased by 18.6 percent for other types of firms — primarily Sino-foreign joint ventures, foreign-funded firms, and private enterprises.

The country's state-owned enterprises in 1996 registered their poorest performance since 1949 with nearly half losing money. The poorest performers include forestry, textile, coal, machinery, and weapons industries. Reform of state-owned enterprises remains the core of economic reform. While the government grants small state-run enterprises more freedom and encourages them to use markets, problems encountered in China's ongoing state-owned enterprise reform are difficult to resolve for large- and medium-

sized enterprises. While experimental work in a number of large- and medium sized state-owned enterprises has been in full swing for more than 2 years, most of large and medium-sized enterprises are still tightly controlled by either central or local governments.

Unemployment in the state sector rose in 1996. The State Statistical Bureau reported that those who registered as unemployed amounted to 3 percent of the labor force in the state sector, but actual unemployment is believed to be much higher, as the number of state-owned enterprises operating at a loss increased. Real unemployment and underemployment in Shanghai, the largest city of China, was estimated at between 15 and 20 percent. The World Bank acknowledges that its estimate that redundant workers (who are still registered with the state enterprise) account for more than 10 percent of the workforce at most state enterprises is conservative. A bloated workforce weighs down many potentially profitable firms. In addition, more than 120 million transient laborers from rural areas have rushed into the country's cities in the past 10 years. This accounts for nearly 10 percent of the country's population, and will further increase the supply of workers in the urban areas of China.

Growth Potential During 1997 and Beyond

The easing of credit that started in the second half of 1996 is expected to further stimulate investment in 1997. Despite recent debates on whether the Asia growth story is at the end, China is at an expansion stage of a new economic cycle and will continue to enjoy benefits from its successful economic "soft landing" in 1997. Its GDP growth likely will be up 11 percent. Inflation will still be in the one-digit category. Exports and imports will likely continue their moderate growth in 1997.

July 1, 1997 will be the first day for the People's Republic of China to reclaim sovereignty over Hong Kong. While many disagreements remain between China and the British Government, a smooth transition is expected at least for the short-run. Given the current healthy economy and business confidence level in Hong Kong, there is not great concern that the Hong Kong dollar and the stock market will collapse.

China's long term economic outlook is inseparable from the future of its state-owned enterprises. While prospects for other parts of the economy remain bright, problems in the state sector, especially in the large- or medium-sized state-owned enterprises, persist. Large state-owned industrial enterprises accounted for less than 1 percent (4,600) of the total number of industrial enterprises. But in 1995, they produced 37 percent of the nation's industrial output and generated 42 percent of total value-added tax to the government. Given such a strategic position in the economy, the government will continue to show caution in reforming large- or medium-sized state-owned enterprises.

Another long term problem is the rising unemployment rate. State-owned enterprises provide more than two-thirds of urban jobs. Workers in such enterprises rely on their employers, not only for wages, but also for housing, medical care, retirement benefits, children's education and other services. Increases in the number of unemployed and laid-off workers, as well as those awaiting work with the increase in the number of state-owned enterprises operating at a loss, will put enormous pressure on the economy and become a major destabilizing factor in China's society. This worry is one of the biggest reasons why China's leaders appear to hesitate to undertake deeper reform in state-owned enterprises, and are reluctant to close money-losing state-owned factories until it can knit together a welfare net, including improvements in unemployment insurance coverage and reform of other social security systems, to care for laid-off workers. This analysis suggests that substantive changes to the state sector will remain a reform goal for years to come.

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China's Agricultural Trade in 1996: Commodity Structure, Geographical Distribution, and Its Role in U.S. and World Agricultural Trade

China's agricultural imports in 1996 decreased by 18.5 percent from 1995, while exports remained almost the same as the previous year. China continues to be a net importer of grains and other land-intensive bulk products and a net exporter of horticultural and consumer-oriented agricultural products. This trade pattern also dominated U.S.-China agricultural trade. U.S. farm exports to China declined from 1995, but still remained above \$2 billion. [Zhi Wang (202)219-0993]

In 1996, China's agricultural trade (exports and imports) reached US\$20.3 billion, a decrease of nearly 10 percent from 1995. The decline stemmed from lower imports which fell 18.5 percent to US\$9.7 billion. Exports increased 0.1 percent to \$10.6 billion. The decrease in imports came from a sharp decline in the purchase of grains, while the small increase in exports stemmed from an increase of corn, rice, and processed intermediate product sales to neighboring countries. China's agricultural net trade structure is consistent with its resource endowments. Land-intensive bulk and processed intermediates constituted the major portion of its agricultural imports, while labor-intensive horticultural and consumer-oriented products were the largest part of its agricultural exports. In 1996, China shipped more than 65 percent of its agricultural exports to neighboring Asian markets. About half of China's agricultural imports came from the United States, Canada, and Australia. U.S. agricultural exports to China in 1996 declined from their 1995 peak but still remained above \$2 billion.

On July 1, 1997, Hong Kong became a "Special Administrative Region" of the People's Republic of China. Hong Kong will continue to maintain its freeport status and customs procedures for 50 years or at least until 2047. In subsequent years it will be useful to begin to treat China and Hong Kong together as one en-

¹Starting this year ERS was able to obtain China's Customs Statistics in an electronic format at the 8-digit HS level of detail, thus permitting aggregation of the data according to the classifications of USDA's FATUS. Therefore, the data may be different from previous issues of this report and official data from China because of different commodity classifications.

²Bulk commodities are unpackaged products that are inexpensive to ship, including grains, oilseeds, plant-based fibers such as cotton, raw rubber, and unmanufactured tobacco. Land-use accounts for a significant share of the production costs for bulk production, especially compared with the other commodity groups. Processed intermediates are goods derived from bulk commodities and need further processing for human consumption. They include flour, feed, live animals, animal fats and oils, as well as animal-based fibers such as wool. Horticultural products are consumer-ready, unprocessed fresh commodities such as fresh fruit, vegetables, and flowers. They often require special handling such as containerization and refrigeration. Consumer-ready processed products are commodities that have been significantly transformed with high value-added such as preserved vegetables, fruits and nuts, fresh and frozen meats, eggs, dairy products, processed meat, and beverages.

tity, for example Greater China. Currently, however, there are great differences between China and Hong Kong's economy: income levels, consumption patterns, economic structures, business organizations, tariff practices, and factor endowments. Also, there are problems in treating Hong Kong's re-export of agricultural commodities to China. Given these differences and data problems, the analysis of China and Hong Kong agricultural trade is separated in two different articles. For a short report on Hong Kong and its agricultural trade, see the article on page 44. This article will focus on the structure of China's agricultural trade in 1995 and 1996. In next year's report, we will analyze the issue of Hong Kong's re-export of agricultural commodities to China.

Commodity Structure of China's Agricultural Trade

In 1996, China's agricultural imports fell 18.5 percent from 1995 because government policies pushed farmers to increase the area sown to grain crops, farmers reaped a record grain crop, and the government tightened control on grain imports. Grain imports decreased by about 47 percent, with corn falling by more than 90 percent, followed by rice (54 percent), and wheat (29 percent). Cotton and vegetable oil imports also fell by 12 and 25 percent, respectively. On the export side, grain exports nearly doubled from 1995 (93 percent in quantity terms, 168 percent in value terms). However, China still remained a net importer of land-intensive products such as grain, cotton, and vegetable oil from the world market. In calendar year 1996, net grain imports were 9.59 million metric tons (half the 1995 level), with more than 8 million metric tons wheat.

To provide a better understanding of China's agricultural trade and the underlying forces shaping its structure, we aggregated China's trade data for 1995 and 1996 into four broad categories based on their factor intensity, degree of processing, and readiness for direct consumption, using trade data in the "Harmonized Commodity Description and Coding System" (HS) from China's General Administration of Customs.

Table 2 presents China's total agricultural trade in 1995 and 1996, which is separated into four major components: bulk commodities; processed intermediate goods; horticultural products; and consumer-ready goods.²

Table 2 -- Total and agricultural trade in China, 1995 and 1996 (million\$US)

	Exports			Imports			Balance		
	1995	1996	Change	1995	1996	Change	1995	1996	Change
Total trade	148,780	151,066	1.5	132,084	138,838	5.1	16,696	12,228	(26.8)
Total agriculture	10,577	10,588	0.1	11,870	9,669	(18.5)	(1,293)	919	(171.1)
Agriculture share	7.1	7.0	(1.4)	9.0	7.0	(22.5)	na	na	na
Bulk commodities	1,045	1,081	3.5	6,469	4,608	(28.8)	(5,424)	(3,527)	(35.0)
Processed intermediates	3,647	3,732	2.3	4,891	4,592	(6.1)	(1,243)	(860)	(30.8)
Horticultural products	1,538	1,495	(2.8)	167	145	(12.8)	1,371	1,350	(1.6)
Consumer-ready products	4,347	4,280	(1.5)	344	323	(6.2)	4,003	3,957	(1.1)

Source: Aggregated from China's Customs Statistics (8 digit HS) and is consistent with USDA's FATUS classification.

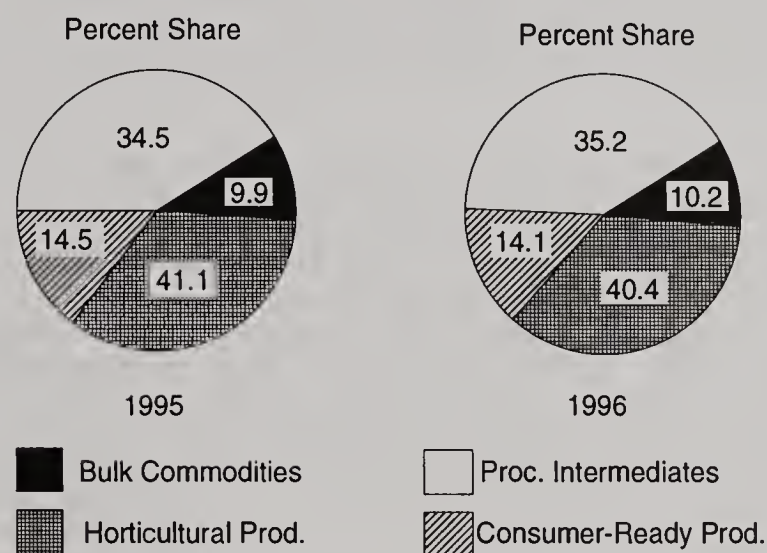
It shows that in terms of total agricultural trade, China shifted from a net importer in 1995 with a deficit of \$1.3 billion to a net exporter in 1996 with a surplus of \$0.9 billion. However, at the disaggregated level, it continues to be a net importer of bulk and processed intermediates, and a net exporter of horticultural and consumer-ready processed goods. The overall net agricultural trade position of China depends on which one is bigger.

Clear economic principles underpin these net trade data. They show that China's agricultural trade behavior is consistent with its factor endowments for food production and international comparative advantage. It is well known that China is a labor abundant country with a relatively poor endowment of arable land. It has to feed 22 percent of the world's population with only 9 percent (Crook, 1993) of the world's arable land. According to standard trade theory, a country tends to be a net exporter of goods which require relatively intensive use of its relatively abundant factors of production, a net importer of commodities which need relatively intensive use of the country's relatively scarce factors.

By importing more land-intensive products such as grains, oilseeds, cotton, and other bulk commodities, and semiprocessed goods for further processing and re-exporting, and by exporting more labor-intensive, more highly processed, high value-added agricultural products to the international market, China is able to increase employment opportunities for its huge rural labor force, enhance its efficiency of food production as a whole, and increase farm income.

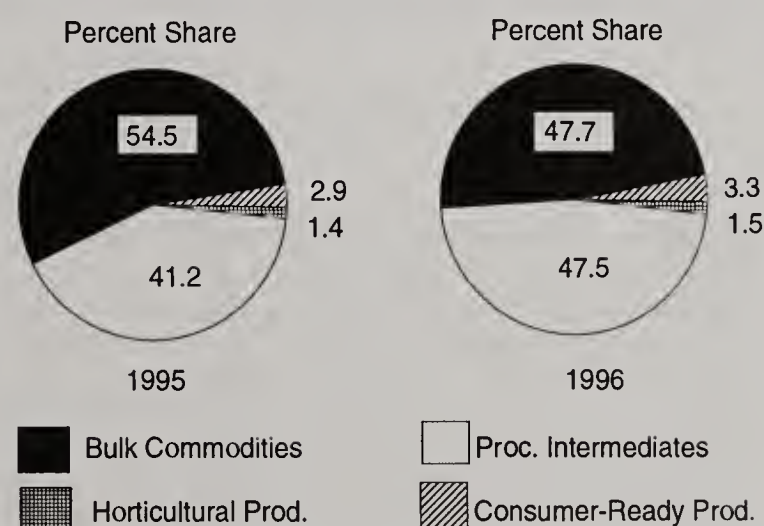
³All trade data in this article, except U.S.- China bilateral, come from China's customs statistics, which is what China officially reported. It may be different from data from other sources such as FAO. Based on Hong Kong trade statistics, there were \$1.74 billion agricultural products re-exported to China from Hong Kong in 1995, it is not reflected in China's import data reported by China's Customs Statistics. We are not certain how China's Customs General Administration handles such re-export data from Hong Kong. If China did not include such re-exports in their trade statistics, the actual structure of China's imports may somehow be different from what we reported here. However, it can not alter the basic conclusion from this article.

Figure 3
Structure of China's agricultural exports



Source: Aggregated from China's Customs Statistics (in 8-digit HS) consistent with classification of USDA FATUS data.

Figure 4
Structure of China's agricultural imports



Source: Aggregated from China's Customs Statistics (in 8-digit HS) consistent with classification of USDA FATUS data.

Figures 3 and 4 show the relative size of the four broad commodity groups for China's agricultural exports and imports in the last 2 years. The structure of China's agricultural trade was stable in spite of the variations in quantities and prices during the last 2 years. About 40 percent of China's agricultural exports were consumer-ready processed goods, while nearly 95 percent of its agricultural imports were bulk commodities and processed intermediates. The only significant structural difference between 1995 and 1996 is the substitution between bulk and processed intermediates.

The import share of bulk goods fell 6.8 percentage points in 1996, while the import share of processed intermediates increased by 6.3 percentage points. The reason for this change is that imports of bulk products fell dramatically compared with processed intermediates (29 over 6 percent), thus increasing the latter's share in total imports. These may be partially explained by the market response to the central government's intervention policies.

The government strongly encouraged farmers to expand area sown to grain crops in late 1995 and 1996 and tightened control on grain imports in 1996. However, this only reduced bulk commodity imports, but the import demands of its close substitutes (processed intermediates) still remain high. Market forces made the adjustment consistent with China's factor endowments. This implies that even with strong governmental intervention, economic outcomes increasingly depend on market forces in China, because 18 years of economic reform have substantially transformed China's economy.

Future domestic economic reform and foreign trade liberalization as China implements its World Trade Organization commitments will reinforce these market forces and could well push China's agricultural production and trade structure along this path for years to come. In 1997, therefore, China will remain a net exporter of horticultural and

consumer-ready processed commodities, and a net importer of bulk and processed intermediate agricultural products, despite lower grain imports in 1996 and 1997 from 1995 because of increased domestic grain production in the recent 2 years.

Geographical Distribution of China's Agricultural Trade

The geographical distribution of China's total agricultural trade for 1995 and 1996 is shown in table 3. The United States, Australia and New Zealand, the Association of South East Asia Nations, ([ASEAN7], includes Indonesia, Malaysia, Thailand, Philippines, Singapore, Burma, and Vietnam), Canada, and the Latin American Newly Industrialized Countries ([LNIC], includes Argentina, Chile, Brazil, and Mexico) were the top five agricultural suppliers to China. Half of China's agricultural exports went to Japan and Hong Kong. The European Union (EU15), ASEAN7, and the two Koreas are the next three largest markets for China's agricultural exports, accounting for another 30 percent of China's sales abroad in 1996.

There were great variations in the agricultural trade flows between China and its major trade partners from 1995 to 1996. For instance, China's agricultural imports from its traditional larger suppliers, such as the EU and ASEAN7 countries, fell by 68 and 47 percent, respectively, while from AUS/NZL and LNICs increased by 55 and 46 percent, respectively, making them China's second and third largest agricultural goods suppliers after the United States. However, the direction of net agricultural trade seems quite stable.

Figures 5 and 6 show China's net agricultural trade flows with its major trade partners. China was a net importer of bulk and processed intermediate agricultural products from the United States, Canada, Australia and New Zealand, ASEAN7, LNICs, and the rest of the world. It was a net exporter of almost all agricultural goods to Japan, Hong Kong, Taiwan, Russia, and Korea in 1995 and 1996. Only China's

Table 3--Geographical distribution of China's agricultural trade, 1995 and 1996

	Exports		Imports		Balance	
	1995	1996	1995	1996	1995	1996
Million\$US						
United States	424	505	3,308	2,060	(2,884)	(1,555)
Canada	64	73	1,110	1,014	(1,046)	(940)
AUS/NZL	60	61	1,170	1,815	(1,111)	(1,754)
LNICs	36	53	935	1,371	(899)	(1,318)
ASEAN7	1,062	861	2,371	1,314	(1,309)	(454)
ROW	716	768	1,291	1,014	(575)	(246)
Russia	470	441	97	94	373	347
EU15	1,355	1,483	1,096	347	259	1,136
Japan	2,858	3,103	130	141	2,728	2,962
Korea 1/	555	786	97	80	458	706
Hong Kong	2,578	2,117	99	81	2,479	2,036
Taiwan	239	185	100	79	139	106
South Asia	161	153	67	258	95	(105)
Total	10,577	10,588	11,870	9,669	(1,293)	919

Source: Aggregated from China's Customs Statistics (8 digit HS) and is consistent with USDA's FATUS classification.
1/ Korea includes South and North Korea.

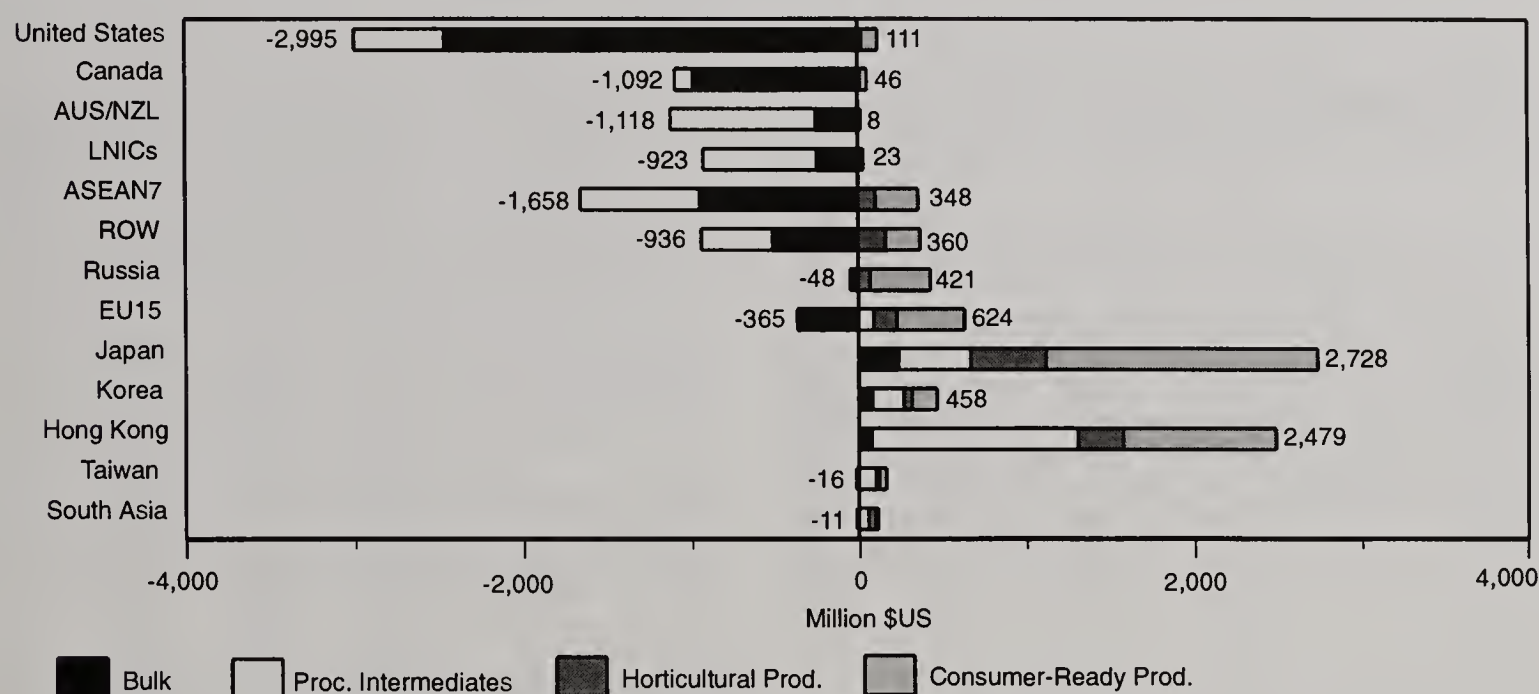
Table 4--Market share of China's agricultural imports, 1995-96

Country	Total		Bulk		Processed Intermediates		Horticultural Products		Consumer-Ready Products	
	1995	1996	1995	1996	1995	1996	1995	1996	1995	1996
Percent share										
United States	27.9	21.3	38.4	35.2	14.5	7.8	6.8	17.8	31.1	17.0
Canada	9.3	10.5	15.3	19.5	2.3	2.0	0.8	12.3	1.1	1.8
AUS/NZL	9.9	18.8	4.1	19.6	17.9	18.7	2.0	14.5	7.9	9.6
LNICs	7.9	14.2	3.8	2.8	14.0	26.9	0.5	0.2	0.7	2.1
ASEAN7	20.0	13.6	17.7	9.4	21.9	16.8	70.2	43.2	12.1	14.5
ROW	10.6	10.4	10.2	9.1	11.7	12.4	10.0	2.2	2.4	2.2
Russia	0.8	1.0	0.9	0.9	0.8	1.1	0.0	0.1	0.3	0.2
EU15	9.2	3.6	8.6	1.3	10.1	5.0	1.3	1.7	13.8	17.2
Japan	1.1	1.5	0.0	0.0	1.6	1.7	2.1	1.6	13.7	18.5
Korea 1/	0.8	0.8	0.2	0.1	1.3	1.3	3.0	3.5	4.3	3.6
CHN3	2.0	1.8	0.5	0.1	3.1	2.7	2.9	2.0	12.5	13.2
South Asia	0.6	2.7	0.3	1.9	0.9	3.6	0.4	1.1	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Aggregated from China's Customs Statistics (8 digit HS) and is consistent with USDA's FATUS classification.
1/ Korea includes South and North Korea.

Figure 5

China's net agricultural trade with major countries in the world, 1995



Source: Aggregated from China's Customs Statistics (in 8-digit HS) consistent with classification of USDA FATUS data.

agricultural trade with South Asian countries changed from surplus in 1995 to a deficit in 1996 because of nearly tripled imports (from a very low level) from those countries. This trade pattern seems consistent with the abundance of agricultural production resource endowments in those countries relative to China. There is no reason to believe this trade pattern will change in the near future providing there is no dramatic technology progress and strong government intervention in China and its partner countries.

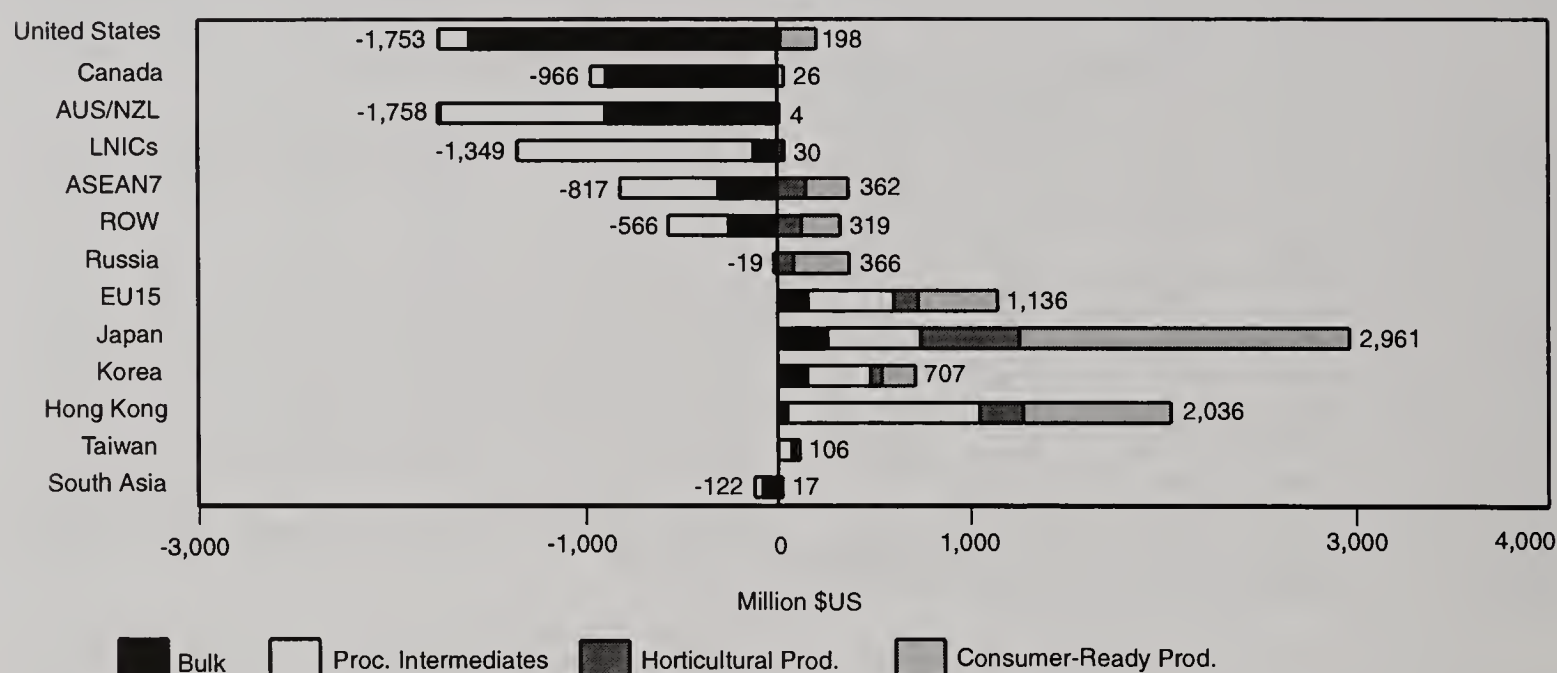
Table 4 presents market shares of China's agricultural imports according to suppliers, while table 5 shows China's agricultural exports by destination for both 1995 and 1996. There are several notable market structure changes in 1996. First, Australia

and New Zealand became China's second largest agricultural product suppliers, occupying 19 percent of the import market, only 2 percent behind the United States. Australia gained in all four types of commodity markets, with bulk goods gaining the most, from 4 percent in 1995 to nearly 20 percent in 1996, becoming one of the three dominant players in China's bulk goods import market (the other two were the United States and Canada, occupying 35 and 20 percent, respectively).

Second, LNICs replaced ASEAN7 countries to become the largest supplier of processed intermediates, taking 27 percent of the market, Australia also increased its share, continually ranking second in this market. The

Figure 6

China's net agricultural trade with major countries in the world, 1996



Source: Aggregated from China's Customs Statistics (in 8 digit HS) consistent with classification of USDA FATUS data.

Table 5--China's agricultural export share by destination, 1995-96

Country	Total		Bulk		Processed Intermediates		Horticultural Products		Consumer-Ready Products	
	1995	1996	1995	1996	1995	1996	1995	1996	1995	1996
Percent share										
United States	4.0	4.8	4.9	4.7	2.1	2.4	4.7	5.4	2.3	2.8
Canada	0.6	0.7	0.6	0.6	0.6	0.8	0.1	0.4	1.0	1.3
AUS/NZL	0.6	0.6	0.5	0.6	1.2	1.1	0.2	0.2	0.4	0.5
LNICs	0.3	0.5	0.3	0.4	0.1	0.2	0.3	0.3	1.2	1.8
ASEAN7	10.0	8.1	11.3	8.9	18.8	11.4	9.8	7.1	14.4	14.1
ROW	5.9	6.4	4.7	5.7	14.3	15.3	3.6	6.0	11.0	8.1
Russia	4.4	4.2	3.5	2.5	2.9	3.8	0.5	0.9	4.6	5.6
EU15	12.8	14.0	10.6	9.8	18.1	20.2	16.0	18.1	9.0	8.8
Japan	27.0	29.3	31.1	29.7	23.2	24.2	13.8	15.0	29.6	34.4
Korea 1/	5.3	7.4	5.8	7.7	9.0	14.6	6.9	10.4	3.5	4.2
CHN3	27.5	22.5	25.8	27.7	8.6	5.1	41.2	32.9	20.3	17.2
South Asia	1.5	1.4	1.1	1.7	0.9	0.8	2.8	3.4	2.8	1.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Aggregated from China's Customs Statistics (8 digit HS) and is consistent with USDA's FATUS classification.

1/ Korea includes South and North Korea.

United States lost significantly, its share fell from 15 to 8 percent. Third, LNICs and ASEAN7 were the third and fourth largest agricultural suppliers to China in 1996, but were quite different in what they shipped. LNIC exports dominated by processed intermediates, which were either land-intensive and/or less expensive to transport, while ASEAN7's exports were more diversified. ASEAN7s played important roles in all the four commodity markets and supplied nearly half of China's horticultural imports because of their proximity to China relative to the LNICs.

Finally, EU, Japan, and Hong Kong were minor suppliers in terms of total farm products. However, they were important players in China's expanding consumer-ready goods market, occupying 17, 18, and 10 percent of the market, respectively. These market-share data indicate that in the bulk commodity market, competition with the United States for market share comes mainly from Australia and Canada (for wheat and barley, China's imported rice mainly is from ASEAN countries). In the processed intermediates market, Australia, LNICs and ASEAN7 countries are major competitors with the United States. Tough competition is expected in the consumer-ready processed commodity market. The EU, Japan, Hong Kong, and

ASEAN7 countries took a large share of this market and were able to compete with U.S. products.

On the export side, Japan, Hong Kong, and Taiwan were the major markets for China's agricultural products. However, the importance of the Hong Kong and Taiwan market declined in 1996 because political tensions reduced China-Taiwan trade flows. China's agricultural exports increased to the Japanese market, especially for its horticultural and consumer-ready commodities. In 1996, Japan alone absorbed more than one-third of China's exports.

Although Hong Kong still remained the largest processed-intermediates market for China, its share was also sharply reduced from 35 percent in 1995 to 28 percent in 1996, while the EU became the second largest market and purchased 18 percent of China's exports. In terms of bulk commodities, Japan was the largest buyer from China (24 percent), followed by EU and Korea (20 and 15 percent, respectively). Overall, Japan bought nearly 30 percent of China's agricultural exports in 1996, Hong Kong ranked second (20 percent), followed by EU, ASEAN7, and Korea, taking 14, 8, and 7 percent, respectively.

Commodity Structure of U.S.-China Agricultural Trade

In 1996, U.S. agricultural exports to China declined 21 percent from its 1995 peak because of sharply decreased grain sales (60 percent), but still reached \$2.1 billion, much higher than 1994 (\$1.1 billion). Tables 6 and 7 present bilateral agricultural trade flows between the United States and China in 1995 and 1996. U.S. exports to China are listed in the four broad categories used earlier and also in major commodity groups, plus selected agricultural-related products, while the data on U.S. imports from China were also segregated into competitive and noncompetitive categories. The data show that although the total U.S. agricultural exports to China declined in 1996, it still had an agricultural trade surplus with China close to US\$ 1.5 billion.

U.S. exports of consumer-ready products increased by 60 percent, despite declining sales in other commodity categories. Stable trade patterns continued as shown from the

net trade data in table 6. The trade value changed significantly in the 2 years, but the United States continued to be a net exporter of bulk and semiprocessed agricultural products, while China continued to be a net exporter of horticultural and consumer-ready commodities.

Given the strong competitiveness of U.S. agriculture as a whole, the expansion of China's net exports to U.S. markets in those two groups of relatively labor-intensive food stuffs demonstrated that there is relative comparative advantage in producing different types of agricultural commodities by different countries. And, it is possible for China to increase its exports of some food products to the world market while importing other food stuffs, especially grains, during its rapid industrialization (Lu, 1996), although it may also be a reflection of China's import protection on those products to some extent.

Figure 7 depicts the structure of U.S. agricultural exports to China in 1995 and 1996. It shows that although U.S. sales of consumer-ready goods to China increased rapidly in recent years, it still accounted for less than 5 percent of U.S. farm products sold in China (its share doubled from 2.3 percent in 1995 to 4.6 percent in 1996). Bulk and semi-processed commodities still constituted more than 95 percent of U.S. agricultural exports to China. It is predictable that this structure will continue to dominate U.S. agricultural exports to China in 1997, in spite of the continuous increase of consumer-ready product exports and the fluctuation of export volumes of individual commodities.

Figure 8 describes the structure of U.S. agricultural imports from China in the last 2 years. Labor-intensive consumer-oriented products constituted nearly 60 percent of U.S. agricultural imports from China. The share of such products was increasing as U.S. agricultural imports from China expanded at a rate of about 25 percent annually. The processed intermediates were the second largest category on the U.S. import list. These were largely specialty items, such as tea, silk, essential oils, and Chinese herbs, and are generally noncompetitive with U.S. farm products. How-

Table 6--U.S.-China agricultural trade, by major category, 1995-96

	1995	1996	1995	1996	1995	1996
	Million\$US					
Total agriculture	2,632.8	2,089.6	454.8	568.8	2,177.9	1,520.8
Bulk commodities	2,029.5	1,609.3	4.0	8.8	2,025.5	1,600.5
Processed intermediates	540.2	382.0	171.4	194.5	368.8	187.5
Horticultural products	2.6	1.5	31.8	36.3	(29.2)	(34.8)
Consumer-ready products	60.5	96.8	247.7	329.3	(187.2)	(232.4)
Selected agric. related exports	1,280.4	943.8	28.1	32.9	1,252.3	910.9
Fertilizers	1,204.2	891.1	1.6	1.8	1,202.6	889.3
Agricultural chemicals	22.4	11.6	3.6	5.2	18.8	6.4
Agricultural machinery	53.9	41.1	23.0	25.9	30.9	15.2

Source: Aggregated from USDA FATUS data.

ever, the share of those traditional items is expected to decline because of the more rapid expansion of consumer-oriented commodities, such as vegetable and fruit preparations, imported from China.

The Role of China in World Agricultural Trade and U.S. Farm Exports

Figures 9 and 10 illustrate the role of China in the world agricultural commodity market by plotting its share in world agricultural exports and imports. These figures show that in aggregate terms, China only plays a moderate role in world agricultural trade, accounting for 2-3 percent of total world trade, despite the fact that its world market share increased over the past 10 years by about 1 percentage point.

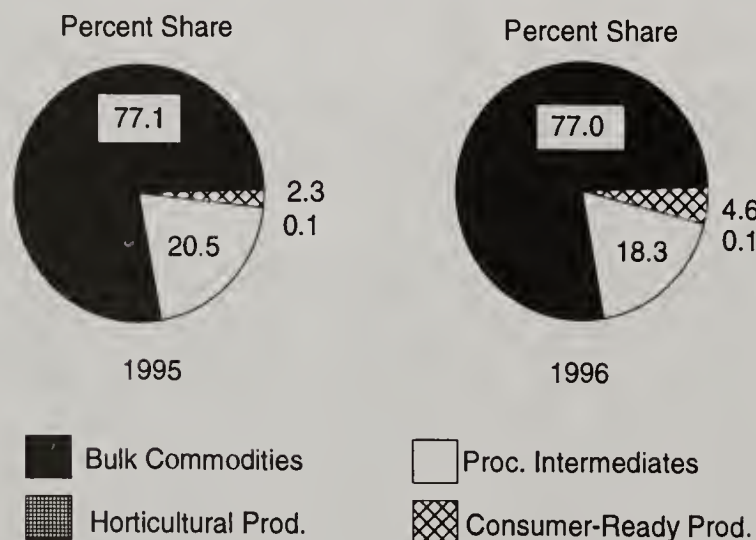
Table 7--U.S. -China agricultural trade, 1995-96

	1995	1996	% change
Million\$US			
Imports from China:			
Total ag.	479.2	596.8	24.5
Noncompetitive	128.7	154.2	19.8
Competitive	350.5	442.6	26.3
Exports from China:			
Total ag.	2,628.8	2,084.8	-20.7
Grains & feeds	1,148.4	464.5	-59.6
Cotton, inc. linters	836.7	729.6	-12.8
Oilseeds & products	410.8	651.8	58.7
Animals & products	204.1	207.4	1.6
Fruits, vegetables, & products	7.4	13.5	83.6
Sugar & related products	6.9	11.9	72.5
Other ag. products	14.7	6.1	-58.2

Source: Aggregated from USDA FATUS data.

Figure 7

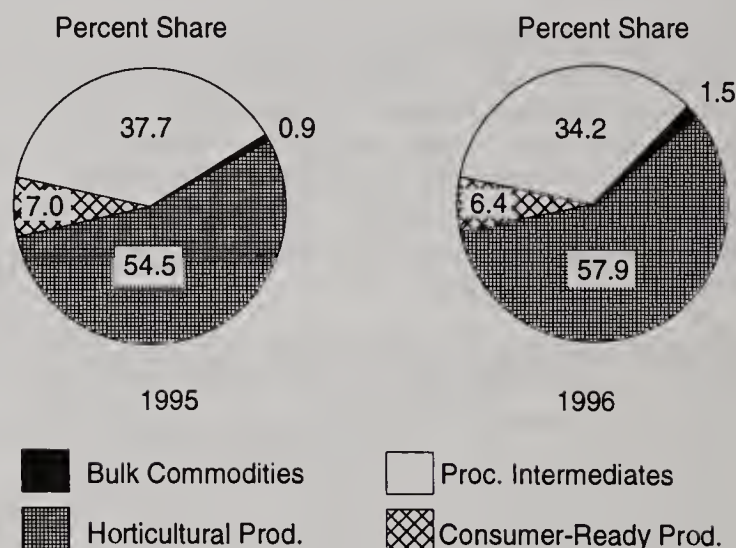
Structure of U.S. agricultural exports to China



Source: Aggregated from USDA FATUS data.

Figure 8

Structure of U.S. agricultural imports from China



Source: Aggregated from USDA FATUS data.

At the commodity level, however, China played an important role in world bulk goods trade, especially grains. On the export side, its bulk export share was generally below 3 percent of the world market (most years less than 2 percent except 1991-1994), while its grain exports had taken nearly 4 percent of the world market in 1993 and 1994, when China was a net grain exporter. On the import side, China is a big buyer of grains in the world market, but the amount it bought fluctuated significantly from year to year. In 1995, it bought more than 8 percent of total world grain exports (in value terms).

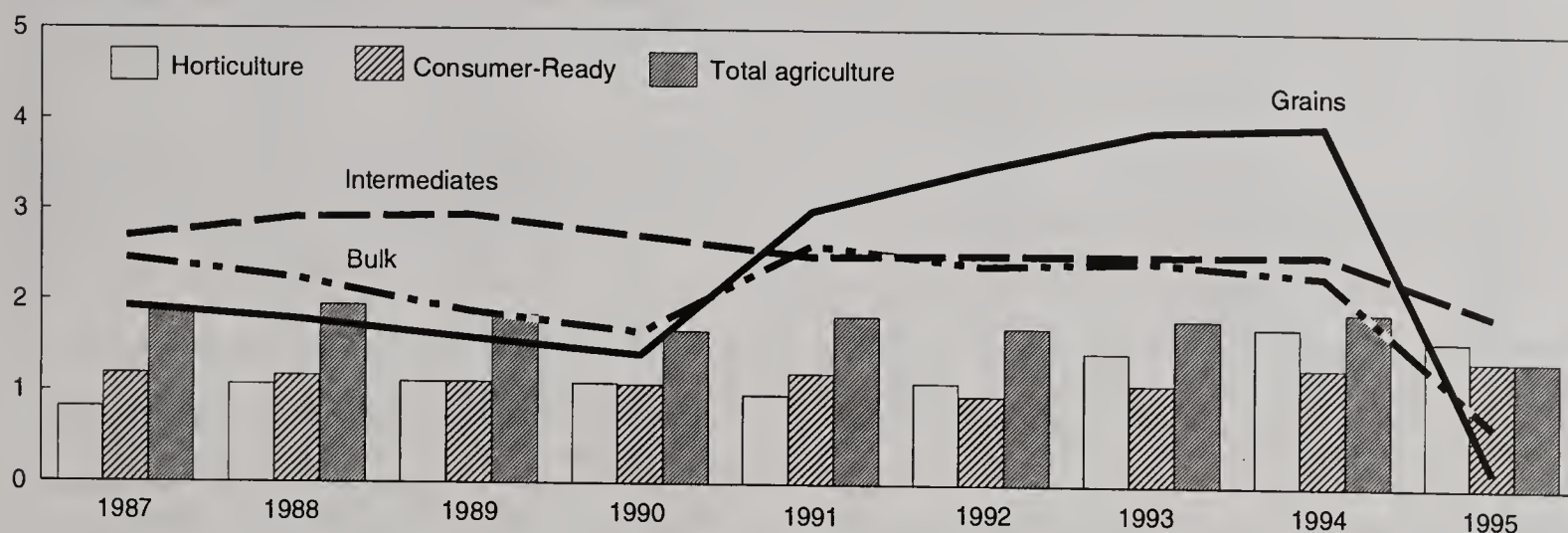
For horticultural and consumer-ready products, China is a consistent net exporter, and its role in world imports is quite small, only absorbing less than a half percent of world imports. On the export side, China's share on the world horticulture and consumer-ready goods market are increasing steadily. However, China still was a moderate player in these two markets, only taking about 2 percent of the total world exports, in spite of the high export growth rate, especially for horticultural products. On the semi-processed intermediate commodity market, China's share in total world exports declined constantly since 1988. Its import share increased continuously since 1990 and shifted from a net exporter to a net importer in 1995, reflecting China's traditional exports such as live animals and tea, grew relatively slowly, while the imports of semiprocessed agricultural products for further processing and re-exporting increased more rapidly in recent years.

Figure 11 illustrates the role of China's market for U.S. farm exports by plotting its share in total U.S. exports of major agricultural products. China is an important buyer of U.S. bulk commodities, although it absorbed less than 5 percent of total U.S. farm exports. In 1996, for instance, it was the world's largest buyer of U.S. cotton, taking 28 percent of total U.S. exports (the second largest buyer—Japan—took 11 percent). It was also the world's third largest buyer of U.S. wheat (7 percent) and the sixth largest buyer of U.S. soybeans (6 percent). However, China is not a stable buyer of U.S. farm goods like Japan.

Figure 9

The role of China's exports in world agricultural markets

Percent of world total

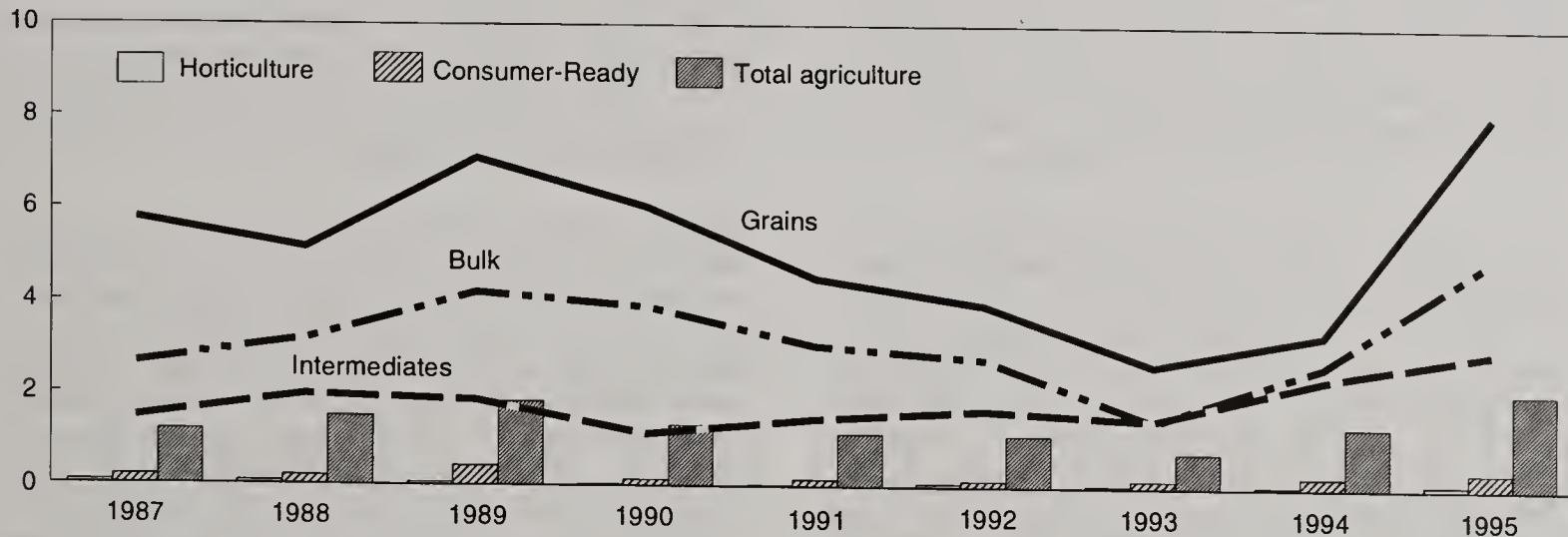


Source: Aggregated from UN COMTRADE database.

Figure 10

The role of China's imports in the world agricultural markets

Percent of world total

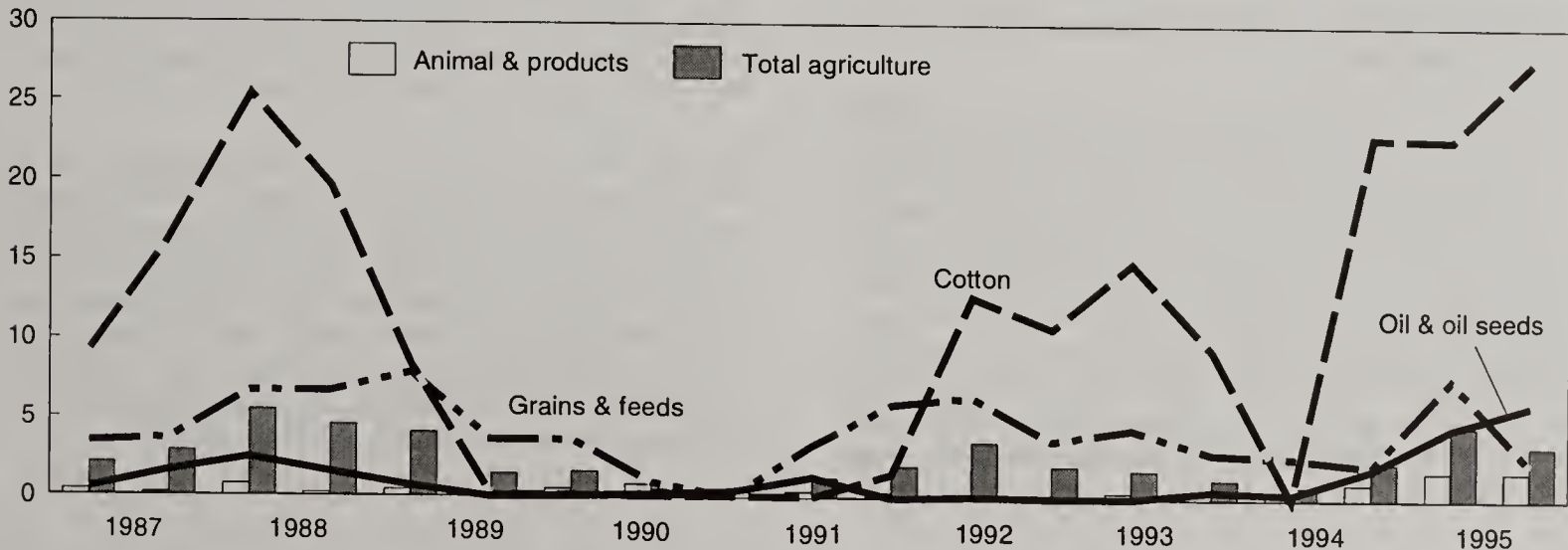


Source: Aggregated from UN COMTRADE database.

Figure 11

China's share of U.S. farm exports

Percent of total U.S. exports



Source: Aggregated from USDA FATUS data.

Table 8--Foreign direct investment in China's agricultural sector, 1979-95

Year	Number of Projects			Pledged Amount (million\$US)		
	Total	Agriculture	% share	Total	Agriculture	% share
1979-88	15,997	853	5.3	28,166	906	3.2
1989	5,779	183	3.2	5,600	121	2.2
1990	7,273	223	3.1	6,596	122	1.9
1991	12,978	325	2.5	11,977	220	1.8
1992	48,764	1,017	2.1	58,124	678	1.2
1993	83,437	1,704	2.0	111,436	1,191	1.1
1994	47,549	1,046	2.2	82,680	992	1.2
1995	37,011	903	2.4	91,282	1,736	1.9
Total	258,788	6,254	2.4	395,858	5,967	1.5

Source: China Statistical Yearbook, various issues.

Its share in total U.S. exports fluctuated significantly during the past 18 years, especially for cotton and grains.

Many factors contribute to China's unstable buying behaviors, but government controls on major bulk commodity trade was one of the major causes. Import decisions are often not based on economic considerations but influenced strongly by shifting of policy regimes. The lag caused by slow information transmission under state trading may also distort trade decisions. However, as market-oriented reform and trade liberalization continue, decisions regarding exports and imports in China may become increasingly determined by the market rather than administrative fiat. China's trade behavior will continue to line up with its comparative advantages.

For example, since China imported nearly 20 million metric tons of grains in 1995, the government changed some policies and required farmers to increase the area sown to grain. However, the increased grain output and reduced imports in 1996 created a condition in which cotton and oilseed areas were reduced. China had to buy relatively more cotton, edible oils, and oilseeds from abroad. As shown in figure 11, its share in total U.S. grain exports fell from 7.7 to 2.3 percent, while its share in total U.S. cotton exports increased from 23 to 28 percent, and its share in total U.S. oilseeds exports increased from 4.6 to 6 percent. This demonstrates that fundamental economic forces eventually make their way (in some countries it may take a long time at a very high social cost), despite decisions made by governments.

Relatively Sluggish Development of FDI in China's Agricultural Sector

The growth of Foreign Direct Investment (FDI) in China has been very impressive in recent years. In 1993, China was the largest single recipient of FDI among low-income countries, absorbing \$27.5 billion, which was 14 percent of global FDI, and 68 percent of FDI flows to Asian developing countries. FDI (actually used) in China reached \$33.9 billion in 1994, \$37.8 billion in 1995, and \$42.3 billion in 1996, making China the second largest FDI recipient country in the world after the United States (DRC, 1996). However, less than 2 percent of those funds went to agricultural sectors. Table 8 presents the contracted FDI into China's agricultural sector during 1979 to 1995.

There are several features of FDI in China's agricultural sector. First, compared with other sectors, the overall scale was very small in number of projects and amount of investment (table 8), despite the agricultural sector still accounting for 20 percent GDP and 52 percent of employment. For example, agricultural projects only constituted 2.2 and 2.4 percent of total FDI projects in China in 1994 and 1995, respectively. The amount of pledged investment of those projects only accounted for 1.2 and 1.9 percent respectively, of the total pledged amount. While China's leaders often state that the agricultural sector is the foundation of their economy, in terms of investment, industrial sectors continuously receive the lion's share. There are almost no special favorable policies to encourage FDI to agriculture.

Second, consistent with the FDI flows to China, FDI in agriculture enjoyed rapid growth in recent years. The data in table 8 show that from 1991 to 1995, the contracted funds to agriculture sectors were \$4.82 billion, 4.2 times the amount pledged during the previous 12 years (1979-1990). Third, consistent with the distribution of FDI in China, the agricultural FDI is also concentrated along the coastal area. For example, Guangdong, Fujian, and Shandong accounted for more than 70 percent of those pledged investments. Fourth, FDI has become the major channel for China to use foreign funds in agriculture. Before 1990, loans were the major form of using foreign funds in agriculture, FDI only accounted for around 20 percent of foreign funds, however, the proportion of FDI increased to 63 percent from 1991 to 1995. Finally, the FDI in agriculture mainly went to food processing sectors, most of which were short- or medium-term small projects, and the investment scale was generally less than \$1 million, far below the average scale of FDI projects in China. (Ma, 1997).

Because capital is one of the most constrained factors for agricultural production in China, attracting FDI into the agricultural sector is an effective way to reduce the pressure of capital scarcity. Hence, FDI has become an important policy in China and obtained high attention from top government leaders. As the FDI policies become more favorable for agriculture, the relatively sluggish development of FDI in China's agriculture is expected to change, and food and agriculture may emerge as a new hot spot of FDI in China.

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Input Supplies Adequate for 1997

China's input supplies, such as chemical fertilizers, pesticides, and plastic sheeting, will be adequate to sustain crop and livestock production for 1997. The institutional framework for delivering inputs is complex at present, and while government institutions continue to play a strong role, markets play an increasingly important role too. Farmers are mechanizing some farm operations to reduce tiresome tasks and to overcome labor shortages.

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Diverse Institutions Supply Farm Inputs

In 1997, a wide diversity of state, collective, and privately owned business firms made farm inputs available to farm families. Business institutions providing inputs supporting grain and cotton production tended to have greater government involvement, and conversely, there was less government involvement in supplying inputs for such crops as vegetables and fruits. In 1995, provincial governments were given authority to manage the sales of key agricultural inputs to farmers as one means to implement the "governor's "grain bag" responsibility system." Manufacturing firms within provinces were to sell their output to the provincial government-owned "agricultural materials companies" (AMCs), which in turn sold products to county AMCs, which sold items to township AMCs and supply and marketing cooperatives, which in turn retailed goods to farmers.

In 1995 and 1996, however, AMCs in some provinces had too much monopoly power, which caused blockages in the movement of much-needed inputs at farm levels. In 1997, the central government suggested AMCs at all levels be subjected to competition. While provincial farm input factories were to sell most of their output to provincial AMCs, these factories were also authorized to sell some of their output to a variety of entities such as township AMCs, township level supply and marketing cooperatives, and to AMCs in other provinces (6). AMCs tend to handle the sales of chemical fertilizers, pesticides, plastic sheeting, diesel fuel, and gasoline.

Seed companies have been set up by provincial, prefectural, and county governments. These seed companies to some extent compete with each other to supply seeds for major crops. Seed for less important crops are supplied by vendors in open markets. Farmers continue to save some seed from the current crop for next year's planting.

Thermal stations generate about 82 percent of China's electrical power. Hydroelectric stations, some very large and many small local stations, generate 17 percent of the power. Nuclear power stations now generate about 1 percent of China's electrical power output. Local governments own and manage electrical supply companies which distribute electrical power to rural households and collect electrical fees.

Large farm machinery, such as tractors, combines, trucks, seeders, and plows, are manufactured by central government, provincial, and city-owned factories. AMCs and Supply and Marketing Cooperatives retail these machines.

When parts break or wear out, farmers can also go to these stores to purchase spare parts.

Enterprises in county seats, township and town seats, and in rural open markets supply farmers with a wide variety of inputs such as plastic pipe, cement, nails, seeds, and hand tools.

Chemical Fertilizers

Investment in chemical fertilizer plants boosted China's production to 28.4 million tons in 1996 (nutrient-weight basis), an increase of 11.3 percent over 1995 (table 9).

Plans called for chemical fertilizer imports in 1996 of about 27 million tons (product-weight basis). But central control of fertilizer imports relaxed, and provinces and local companies actually imported much more than that (6).

According to State Statistics Bureau estimates, farmers applied 38.5 million tons of chemical fertilizers in 1996 (nutrient-weight basis), an increase of 6.5 percent over 1995. This quantity includes both domestically produced fertilizers and imported product.

An SSB survey of agricultural production inputs, conducted in spring 1997, found fertilizer supplies adequate in most provinces (1). The output target for the year 2000 is 28.4 million tons (nutrient-weight basis), a target which already has been reached. Plans call for expanding output capacity to produce nitrogen, phosphorous, and potassium fertilizers.

Plastic Sheetting

In 10 years, the quantity of plastic sheeting used by farmers in China more than doubled, from nearly 300,000 tons in 1987 to 700,000 tons in 1996. Farmers use plastic sheeting in a wide variety of ways, including covering greenhouses. It is common now to see large areas of land near towns and urban areas with plastic covered greenhouses. The expansion of greenhouse area likely will continue in 1997. For example, in 1997, Henan provincial leaders intend to expand area under greenhouses by 1.67 billion square meters to raise vegetable output and provide higher incomes for farmers.

For more land-extensive crops, there is a nationwide program to raise young rice and corn seedlings under plastic sheeting. By giving the young plants a head start, farmers can raise corn in areas that have a short growing season. Also, in even warmer areas, the use of plastic sheet-

Table 9--China's major manufactured farm inputs, 1994-96

Item	Unit	1994	1995	1996
Year end stocks:				
Lrg-med tractors 1/	1,000s	690	670	680
Hand tractors	1,000s	8,235	8,633	NA
Rural trucks	1,000s	760	800	800
Machinery production:				
Lrg-med tractors 2/	1,000s	46	63	83
Hand tractors	1,000s	1,355	2,063	1,937
Rural electricity				
consumption 3/	Mill. KWh	147,370	165,550	183,400
Fertilizer output 4/	1,000 tons	22,728	25,481	28,357
Nitrogen 4/	1,000 tons	17,363	18,592	21,536
Phosphate 4/	1,000 tons	5,044	6,626	6,166
Potassium 5/	1,000 tons	321	263	655
Fertilizer applied	1,000 tons	33,179	35,922	38,278
Cultivated land 6/	1,000 ha.	94,910	94,971	94,344
Chemical pesticides	1,000 tons	290	417	427
Plastic sheeting 7/	1,000 tons	375	614	700

1/ Large or medium sized tractors with a capacity of 14.7 Kw or more.

2/ Wheeled and crawling tractors of 14.7 Kw capacity or more.

3/ Not all for agricultural production. 4/ Effective nutrient weight.

5/ Numbers in parenthesis derived. 6/ China Statistical Yearbook.

Cultivated land is under reported, so actual arable land is higher than reported here (See 1993 China Report, pp. 33-39). 7/ China Daily, April 13, 1997.

ing permits farmers to raise more than one grain crop a year, i.e., winter wheat and summer corn or rice.

The expanded use of plastic sheeting has also brought some environmental problems. Local officials are wrestling with the problem of how to dispose of used plastic sheeting. A common scene now in rural areas is piles of old sheeting dumped on waste land or bits of plastic caught up in bushes and fences, flapping in the breeze.

Mechanization

The use of farm machinery is increasing for very specialized farm operations.

Moving water—While one can still see manpowered water lifting machines in operation in China today, the largest share of water for irrigation and drainage comes from diesel and electric powered pumps. Currently, there are over 9 million pumps being used in China to pump water. Diesel engines provide power for about 48 percent of the water pumped. Electric motors account for the remaining 52 percent. In 1996, rural electric power consumption totaled 183.4 billion kWh, presumably a good portion of this electrical energy is used by farmers to irrigate and drain their fields.

Plowing land—Farmers are still turning over their land with shovels and hoes and using draft animals. But, currently 36 percent of total sown area is plowed with the use of small, medium, and large tractors. This is especially true in those areas in which farmers must harvest one crop and plant the next one with enough time to mature the second crop.

Seeding cropland—Most farmers continue to seed their crops by hand, either by hand sowing or by pulling small

hand drawn seeders. Currently, about 20 percent of the total sown area is machine planted.

Harvesting crops—The great burden of harvesting crops continues to be done by hand. But labor shortages in some areas of the country where planting and harvesting must be completed within a tight framework have encouraged farmers to purchase harvesters. Currently about 11 percent of the total sown area is machine harvested (4).

Hauling products—At present huge quantities of bulk materials are carried by hand, wheel barrows, small hand carts, and bicycles. Wagons and carts pulled by draft animals are still a common sight. But an increasing share of materials are beginning to be hauled by machines. Annual sales of motorcycles in rural areas are 3 to 4 million. The number of motorcycles per hundred rural households increased sharply from 1 in 1990 to 8 in 1996. Small tractors powered with 10 to 15 horsepower diesel engines have become the prime beasts of burden in rural China. A large portion of the more than 8 million of these small tractors participate in some transportation service during each calendar year (3). The number of agricultural use trucks rose from 624,000 in 1990 to 790,000 in 1995.

Market Information and Communication

The Ministry of Agriculture and the State Administration for Grain Reserves currently are publishing commodity supply and use information for producers, consumers, millers, and government authorities. For example, the Ministry of Agriculture published its second situation and outlook report entitled *Report on China's Agricultural Development '96*. The State Administration for Grain Reserves publishes monthly reports which contain price data for various agricultural commodities. Currently, the United States Department of Agriculture has a program with eight ministries and bureaus in China to assist officials in Beijing prepare supply and use tables for rice and cotton and write short reports analyzing market supply and demand conditions for these products.

Almost all townships and towns and 53 percent of administrative villages are now connected with telephone lines (5). This has greatly improved efficiency of communication, and local producers are now in a better position to understand market conditions to purchase inputs and market their commodities. For example, small rice millers in Hunan province use telephones to conclude polished rice contracts with retailers in Canton. They then purchase paddy rice, mill it, and truck it to Canton in a few days time (see article on "The Emergence of Private Rice Marketing in South China").

In 1996, all but one county (in a remote part of Tibet) is linked by a road network. More than 97 percent of towns and townships and 79 percent of administrative villages can be reached by car and truck. This means that farmers have greater access to inputs and information than ever before. These rural road networks have greatly aided the market circulation of goods and services in the last decade. Improvements can be made in the road system, as currently only 23 percent of China's roads are paved with asphalt or concrete (2).

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China's 1997 Agricultural Census

In January 1994, China's State Council made a decision to undertake its first agricultural census in 1997. China's leaders have begun to understand the importance of obtaining basic agriculture and rural data to formulate better policies at various levels and to promote the development of agriculture, rural areas, and even the national economy. China's first agricultural census has received technical and financial support from international organizations and many countries, including FAO of the United Nations, the United States, Italy, and Japan. [Francis Tuan (202) 219-0471]

The main contents for the first census include:

1. The characteristics of rural households and non-household holdings.
2. Rural population and personnel characteristics.
3. Stock and flow of land in agriculture, forestry, and fisheries.
4. Stock and flow of rural labor.
5. Stock and flow of capital in agriculture, forestry, and fisheries.
6. Community environment.
7. Living environment of rural residents.
8. General characteristics of non-household holdings.

China's State Statistical Bureau (SSB) estimated that the census will require 30,000 administrative organizers and 6,000,000 enumerators. The results of the agricultural census will begin to be published about 6 months to a year after the surveys. The publications will be released on a continuous basis as soon as results are compiled. This will be different from the fixed-schedule publication as practiced in most other countries.

The census will help foreign researchers and investors, as well as China's officials to better understand China's agricultural sector. For instance, agricultural land use will be surveyed and estimated and, therefore, we expect the SSB to officially announce the actual cultivated land area shortly after the completion of the census. This will have a critical impact on the adjustment of over-stated yields of different crops or on the potential of yield growth of China's many crops in the future. [Francis Tuan (202) 219-0471]]

Current Agricultural Policies Highlight Concerns About Food Security

Grain supply and demand conditions are watched closely by citizens and leaders in China much like U.S. citizens follow interest rates and the stock market. This article examines the special role grain plays in China's culture and describes a new policy called the "governor's "grain bag" responsibility system," which aims to increase China's grain self-sufficiency rate. Grain production has risen in the last 2 years, and China's grain imports have fallen. But the policy also has reduced efforts to specialize production, increased internal trade restrictions, and altered foreign trade patterns. [Frederick W. Crook (202) 219-0002]

China's leaders are transforming their largely centrally planned economy into a "socialist market economy" with China characteristics. Transformations include using markets to guide producer and consumer decisions while the central government retains political control and uses macroeconomic mechanisms to manage the economy. While markets and market forces have become increasingly important to China's rural economy, government intervention remains significant in agriculture.

Food policy objectives have been remarkably stable in China since the early 1980s. These objectives are listed on the left side of the page and on the right side are listed some of the policy tools administrators have to reach their often contradictory objectives (1).

Policy Objectives	Policy Tools
Insure urban food supply	Adjust production, consumption, and marketing.
Raise farm income	Adjust prices and reduce taxes.
Stabilize prices	Adjust the money supply, investment, and savings.
Encourage food self-sufficiency	Adjust production, consumption, and stocks.
Accumulation of grain reserves	Build or use stocks.
Participate in world trade	Adjust imports or exports.

As with the food policy objectives of many countries, some of China's objectives are mutually exclusive or at least difficult to accomplish simultaneously. At various times over the past 40 years, the central government has emphasized the achievement of certain objectives while neglecting others. And changes in policies have sometimes had dramatic effects on China's agricultural economy, production, consumption, stocks, and trade.

Grains Play a Special Role in Food Security Issues

In both ancient and modern times, China's leaders tend to define food security as grain security. Grain supply and demand conditions, stocks, and prices in China have a special place. Whereas U.S. politicians and citizens are constantly aware of movements of the "Dow Jones index" and the "prime rate," politicians and citizens in China are concerned about grain production, grain prices, and grain stocks. For example, the Book of Rites compiled centuries B.C., "warns that a country without stocks for nine years' requirements has insufficient reserves; with less than six years' reserves the situation 'becomes tense;' and with less than three years' stocks, the government will not survive." (3) In 1776, the Qing dynasty had a well regulated grain storage system and organized a large bureaucracy to manage the granaries which regularly stocked millions of tons of grain. Modern China's leaders have carried on this emphasis on grains.

From the mid-1950's to the early 1980's, China's rural economy was organized into people's communes that controlled all aspects of rural life. Government-owned institutions managed the circulation of agricultural products from farm gate to consumers, and the century-old open marketing system was closed. The government's Grain Bureau purchased, transported, stored, milled, and retailed grain, primarily to feed urban consumers.

Then, in the early 1980's, the government disbanded the commune system, allowed the old open marketing system to revive, and set up the household land contract system in which farm households were permitted to sign long term land contracts to cultivate specific plots. As long as farm households delivered specified quotas to local Grain Bureaus—thus paying their taxes and meeting government grain procurement requirements—the households were free to produce whatever they wanted and were permitted to sell their goods through local open markets.

The central government raised the purchase price of wheat to encourage farmers to produce more, but the Grain Bureau retail shops in the urban areas continued to sell flour at low prices that had largely remained constant since the early 1960's. By the late 1980's, China's government found that over 20 percent of total national govern-

ment revenues were used to finance the gap between the purchase and retail price of grain.

Starting in 1992, the central government introduced market reforms to reduce the burden of the grain subsidies and to improve the economic efficiency of grain markets. By the end of 1993, these market reforms accelerated, as 28 out of 31 provinces began to phase out the grain ration system that allowed urban consumers to purchase grain at low fixed prices. Thus, to many observers, it looked like China would steadily pursue an economic course based on free markets and comparative advantage.

Government Re-emphasized the Importance of Grain

Three factors seem to have pushed China's leaders from 1994 to 1996 to reassert government control over grain markets, veer away from the principle of comparative advantage and restrict market operations.

First, inflationary pressures in late 1993 and early 1994 and a sharp rise in rice prices in 1994 undermined the government's resolve to carry out market reforms. While there may have been local rice imbalances, on a national basis there does not appear to have been a huge gap between demand and supply. A major factor underlying the general rise in prices was the large increase in the money supply, as the Ministry of Finance was required to issue more money to bail out inefficient state-owned enterprises and to increase wages and bonuses to largely urban workers. In 1994 and 1995, anti-inflationary measures were instituted, including price controls. Price stability has always been important to China's central leaders, many of whom witnessed the devastation of hyperinflation at the end of World War II. When the objective of price stability came into conflict with raising farm incomes, China's leaders chose their traditional urban bias of pursuing price stability.

Second, while rural reforms brought relatively rapid increases in grain production in the 1980's, the rate of increase slowed in the 1990's, and leaders became concerned about the decrease in the area sown to grains.

Third, in 1994 and 1995, analysts in and outside of China questioned the country's capacity to produce enough grain to meet growing consumption requirements. It is possible that these reports had a sobering effect on the central leaders, pushing them to limit market reforms and initiate the "governors' "grain bag" responsibility system," a policy designed to promote adequate supplies of domestic grain at provincial levels whenever possible.

Basic Features of the Governors' "Grain Bag" Responsibility System

In late 1994, the central government initiated a new grain policy (*mi dai zi shengzhang fuzezhi*), hereafter referred to as the "grain bag" policy in which provincial governors were given specific responsibilities concerning grain supply and demand. The policies apply to all grain crops—especially to wheat, corn, and rice. Under this policy, governors are responsible for:

- stabilizing area sown to grains;
- guaranteeing investment in inputs like chemical fertilizers to stimulate grain production;
- guaranteeing that certain quantities of grain are put into stocks;
- insuring that transfers of grain in and out of a province are completed;
- stabilizing urban residents' concerns by supplying grains and edible oils;
- stabilizing grain and edible oil prices;
- controlling 70 to 80 percent of commercial grain sales;
- developing means to control grain markets;
- raising commercial sales as a share of grain sales;
- controlling grain imports and exports; and
- raising the level of grain self sufficiency.

The policy may be a temporary measure to bridge the gap between the former policy of heavy government involvement in the planned purchase and planned supply system (1955-1994) and greater use of the market system. Government leaders hope the "grain bag" policy will give impetus to greater use of the market while still preserving some elements of government control.

Provincial governors begin to implement their responsibilities by having each county Grain Bureau office draw up a county total grain output and total grain demand balance sheet. These balance sheets are probably sent to the provincial Grain Bureau office which estimates and plans grain transfers between grain deficit and surplus counties within the province. The governor then has the data to estimate his provincial total grain output and total grain demand to determine his grain surplus or deficit status. These balance sheets are delivered to the appropriate office in the Ministry of Internal Trade.

If the province is grain deficit, then the governor must first attempt to increase supplies by stabilizing or increasing the area sown to grain (keeping in mind the overall agricultural development goals, i.e., livestock, cash crops, forestry, etc.), increasing the supply of inputs to raise yields, and providing subsidies to grain producers. Second, the province provides a list for the amounts and kinds of grains to be purchased domestically or imported. Third, the governor purchases domestic grain through wholesale markets or receives imported grain from the central government.

If the province produces a grain surplus, then the governor maintains efficient grain production and supports grain sales to deficit provinces.

With regard to natural disasters, local resources should be used first. If the local government cannot handle the situation, then the State Administration for Grain Reserves will provide assistance. The central government took this course to reduce its financial exposure. The financial responsibility for managing grain and edible oil has been transferred from the central government to provincial levels.

To achieve these objectives, governors will use their provincial Grain Bureaus which will perform policy and commercial operations. Policy operations consist of purchasing grains (oilseeds) at fixed quota prices (below market prices), transporting, storing, milling, transferring and retailing grain. Losses incurred by the policy divisions in the Grain Bureau while performing these operations will be subsidized by the central government. For 1995, the central government planned to purchase 50 million tons of grain via this operation. With regard to the old grain and edible oil rationing system (1953 to 1993), urban families were issued grain books which entitled them to purchase fixed quantities of grain and edible oils at low fixed prices in government-operated grain stores. Grain coupons were issued as a means of implementing this distribution system. In 1993 the coupon system ended (9).

In 1995, various provinces used different systems, such as grain books, grain coupons, or controlled markets to help low income families obtain low-priced grains in the government owned grain stores. In making these purchases, low income families do not have a lot of choice...they buy whatever product is on the shelf. Usually the grain there tends to be older and of lower quality. Higher income urban residents purchase their grain in open markets and this grain tends to be fresher and of higher quality (2).

This new policy has made it more difficult to generalize about China's grain economy. Whereas before, there was one policy for the whole country, now individual provinces can have different policies, for example, they can add subsidies to the grain purchase price. For example, in 1995 the fixed-quota price for corn in northeast provinces was 660 RMB/ton, 820 RMB in the North China Plains area, and 920 RMB in South China. Also, provinces can use different methods to handle grain supplies for urban poor. As an example, in 1995 the author visited three provinces and found three different systems to disburse grain to urban poor people. One simply allowed open markets to function, the second used grain coupons, and the third used grain books (2).

The policy has been implemented for only about 2 years, which means that few materials have been published to serve as a basis for evaluation. However, general observations can be made on the policy's effect on China's agricultural economy.

Area Sown to Grain and Other Crops

From a national point of view, cultivated area dropped steadily from 99.5 million hectares in 1979 to 94.3 million in 1996. Sown area decreased from 148.4 million hectares in 1979 to 143.6 million in 1985, but increased since

then. There was a slight dip in sown area in 1993 but then rose to 152.2 million hectares in 1996. China's multiple cropping ratio decreased slightly in the early 1980s but increased in the late 1980s and early 1990s. The ratio increased from 1.562 in 1994 to a record 1.61 in 1996. The dominant trend in crop land use has been a reduction in the percentage of area sown to grain and an increase in area sown to economic and other crops. But in 1996, area sown to grains increased and area sown to cotton, edible-oil crops, and hemp decreased (8).

Provincial leaders used various measures to boost grain sown area by 517,000 hectares in 1995 and 2.3 million hectares in 1996. Using 1995 data (the most recent available) we separated provinces into grain surplus, self-sufficient, and grain deficit categories and then compared changes in area sown to various crops from 1994 to 1995 (6 and 10). To classify the provinces into surplus, self-sufficient, and deficit categories, we relied on the research completed by the late Professor Kenneth Walker and Nicholas Lardy (6 and 10). Grain surplus provinces produce more grain than required in the province and are in a position to transfer grain to other provinces. Grain production in self sufficient provinces just equals requirements. Grain requirements in deficit provinces are greater than production.

Grain surplus provinces responded to the new policy by increasing area sown to grain by 123,000 hectares. They reduced area sown to wheat, increased area sown to rice, expanded area sown to corn by 745,000 hectares, reduced area sown to soybeans, cotton, tobacco, and other crops, but expanded area sown to vegetables.

Grain self-sufficient provinces in 1995 increased the area sown by 250,000 hectares. As a group they decreased area sown to wheat, but increased area sown to rice and corn. They increased area sown to oilseed crops and vegetables but reduced area sown to soybeans, cotton, and other crops.

Grain deficit provinces in 1995 increased area sown to grain crops by only 57,000 hectares. Area sown to wheat, rice, and corn increased, with the largest increase in area sown to corn. They also increased area sown to oilseeds, cotton, and vegetables, but reduced area sown to soybeans.

In summary, it appears self-sufficient and deficit provinces responded to the "grain bag" policy by increasing area sown to grain while surplus grain provinces pursued a diversification strategy. Leaders in surplus provinces could say, "We have grain surpluses, let us diversify our rural economy and follow our comparative advantage." Demand for feed grains spurred surplus, self-sufficient, and deficit provinces to expand area sown to corn.

Central leaders worried about the relative slow growth of grain production in the early 1990s and formulated the "grain bag system" to boost production.

Increased Supply of Inputs

Central and provincial authorities implemented policies such that investment in agriculture increased. In 20 prov-

inces, investment in agriculture increased by about 15 percent. Some provinces allocated 15 percent of the investment in the agricultural sector to agricultural extension.

According to a Ministry of Agriculture survey, 19 of 25 provinces added subsidies to their fixed-quota grain purchase price and added subsidies for chemical fertilizers as well. The average subsidy for fixed-quota grain purchase price ranged from 40 to 420 RMB per ton. The average support for chemical fertilizers ranged from 100 to 640 kilograms of chemical fertilizer per ton of grain sold under the fixed quota purchase system (7).

Chemical fertilizers applied increased from 33.1 million tons on a nutrient-weight basis in 1994 to 35.9 million tons in 1995 and 38.2 million tons in 1996, an 8.1 percent and 6.5 percent increase, respectively. Chemical pesticide production increased from 268,000 tons in 1994 to 360,000 tons in 1995 and 427,000 tons in 1996 (1 and 8).

In 1995, provincial governments allocated funds to strengthen water control facilities to improve farmers' ability to overcome floods and droughts. Provincial leaders also mobilized the rural labor force in corvee projects to construct water works (7). In 1996, 50 million hectares were effectively irrigated, an increase of 1.5 percent over 1995 (8).

In 1996, investment in the agricultural sector (agriculture, forestry, animal husbandry, fishery, and water conservation) was 33.5 billion RMB, up by 27.5 percent from 1995 and its share of total investment rose from 1.8 to 1.9 percent. The country invested 301.2 billion RMB in transportation and communications, up 22.1 percent from 1995, and its share of total investment rose from 17 to 17.3 percent (8).

Grain Production Rose Under the "Grain Bag" Policy

Central leaders worried about the relatively slow growth of grain production in the early 1990s and formulated the "grain bag system" to boost production.

Grain Distribution (Marketing) Under the "Grain Bag" Policy

The "grain bag" policy specified that provincial governors were to insure that grain transfers in or out of the province are implemented and that food grain requirements for urban residents, universities, and the military are supplied.

In past years, the central government (the Grain Bureau) worked out transfers of grain between grain surplus and grain deficit areas. Imported grain was transferred to the Grain Bureau in some grain deficit provinces.

With the "grain bag" policy, the central government seems to be trying to partially retire from the grain transfer business. Provincial governors now have the responsibility to maintain balance between supply and demand within their own provinces. Essentially, they are supposed to use "markets" to buy and sell grain to achieve grain balances. In some areas of the country private, traders (including grain mills) are increasing their grain market activities. For exam-

ple, in the next article Luo and Crook argue that in recent years private rice traders in south China have become an important source of rice supplies for large coastal cities.

Provincial authorities have responsibility to manage special grain stocks and grain risk funds to stabilize local grain markets. They can best implement these policies if they erect provincial grain boundary measures. For example, Heilongjiang province restricted the outflow of soybeans, and Jilin controlled the outflow of corn (5). The two-level stock system and two-level grain risk fund (national and provincial) did not function too well because national interests did not always parallel provincial interests. The conflict between Beijing and the provinces led to poor policy implementation (5).

Professor Ke Bing-sheng, China Agricultural University, has pointed out that the central government has had difficulties implementing market policies because of the many different institutions involved. For example, he notes that the following organizations are involved in managing the "grain bag" system: the State Administration for Grain Reserves, the State Planning Commission, the Ministry of Finance, the Ministry of Internal Trade, the Ministry of Agriculture, and the State Commission for Economic Cooperation and Trade (5).

In 1995, the central government took two measures to achieve a grain balance. First, it imported 19.8 million tons of grain. Second, it transferred 2 million tons of stored corn from northern to southern provinces to reduce the price of feed stuffs (9).

Several marketing problems arose in 1995. First, some areas emphasized local grain balances only and set up measures to restrict grain flows among administrative units. Second, some provinces implemented the "grain bag" responsibility system by contracting responsibilities all the way from the province, prefecture, county, township, and to villages. Third, some producing provinces only were concerned with achieving their own balances within their own provinces. They relaxed their efforts to expand grain production for the benefit of the whole country (7, p. 69).

Grain marketing data for 1995 and 1996 are not yet available. At the moment, we cannot tell if government entities achieved the goal of controlling 70 to 80 percent of commercial grain sales.

Grain Stocks Under the "Grain Bag" Policy

The "grain bag" policy specified that provincial governors were to guarantee that certain quantities of grain are put into

Table 10--Grain output, 1993-96

Year	Production	% change
Million metric tons		
1993	456	na
1994	445	-2.4
1995	467	4.9
1996	490	4.9

stocks. The State Council has asked producing provinces to store the equivalent of 3 months of grain consumption and consuming provinces to store a 6-month supply. On-farm grain stocks rose by about 25 million tons in 1995. It may be that as market prices fell during 1996, farmers panicked and began to unload on-farm grain stocks which they could sell to government-owned grain stations at the fixed quota price. But, given the record 1996 grain crops and the great difficulties local grain bureaus had in raising funds to purchase grains, our best guess is that on-farm grain stocks rose substantially in 1996. Recent news accounts from China note that government grain stocks rose by 51 million tons at the end of 1996 (9).

Authorities in China regard state stocks, that is those controlled by the State Administration for Grain Reserves and provincial governors, as state secrets. Generally, these stocks are estimated to be around 135 million tons (3).

In the past few years, authorities have organized a very complex grain reserve system. Essentially six institutions participate in storing grain: 1) the State Administration for Grain Reserves (SAGR); 2) the Grain Bureau's program policy divisions (fixed quota procurement and urban grain stores); 3) the Grain Bureau's commercial divisions (open market procurements and commercial operations); 4) rural economic collectives (old communes and village storage); 5) grain processing mills (rice, wheat, feed mills); and 6) farm households who have their on-farm grain stocks.

The State Administration for Grain Reserves (SAGR) tried to use grain stocks to dampen price fluctuations in two cases. In the first case, the SAGR allocated 15 million tons of stocks in 1995 to constrain price increases in grain markets. According to several sources inside China, this effort met with only partial success because of the timing of the stock release and the manner in which stocks were released into the market. In the second case, the state transferred 6 million tons of corn from Manchuria to central and south China in 1995 and 1996 to constrain feed grain price increases (9).

Grain Prices Under the "Grain Bag" Policy

The "grain bag" policy specified that provincial governors were to stabilize grain prices. Urban retail prices for flour and rice did rise from 1993 to 1995, but large grain crops

in 1995 and a record crop in 1996 increased supplies and prices leveled off. In 1996, there were two prime price developments. First, to encourage grain production the government increased the fixed quota procurement price for wheat, rice, and corn. For example, the procurement price for rice rose 36 percent from US\$129 per ton in January 1996 to US\$176 in August. Second, during 1996, the central government through the State Administration of Grain Reserves and provincial governments through their "Grain Bureaus" sought to dampen price swings in grain markets. In the first half of 1996, the market prices of wheat, rice, and corn rose and these government entities used various means to arrest the price increases. But as farmers began to reap record grain crops, market prices for these grains began to fall. During the last half of 1996, SAGR and provincial "Grain Bureaus" tried to keep grain prices from falling. For a more detailed examination of wheat, rice, and corn prices see the article on grains below.

International Trade Under the "Grain Bag" Policy

The "grain bag" policy specified that provincial governors were to do all in their power to increase grain production and buy domestic grain to balance gaps between demand and supply. If governors still had a deficit in their grain balance then the central government was to arrange for grain imports.

With the implementation of the "grain bag" policy in 1995, 1996, and 1997 grain imports decreased substantially.

But in 1995 and 1996, oilseed, oil meal, and edible vegetable oil imports rose substantially. In 1996, China imported nearly 3.5 million tons of edible vegetable oil, accounting for about one third of domestic consumption (see oilseed article below). These import figures highlight the importance of grain in the consciousness of China's leaders—leaders said nothing about importing one-third of their domestic consumption of edible oil, but feel it is a great feat to have imported less than 2 percent of their grain requirements.

Imports of chemical fertilizers increased dramatically; from 10.2 million tons in 1993 to 12.7 million in 1994, to 19.9 million in 1995, and 18.6 million tons in 1996. In 1996, China imported 6 million tons of urea (2.76 million tons nutrient-weight basis); 3.4 million tons of potassium

Table 11--China's International grain trade, 1994-96

Commodity	Imports				Exports			
	1994/95	1995/96	1996/97	1997/98	1994/95	1995/96	1996/97	1997/98
Million metric tons								
Wheat	10.2	12.0	3.5	3.5	0.0	0.0	0.2	0.2
Rice	2.0	0.8	0.8	na	0.0	0.2	0.8	na
Corn	4.3	2.0	0.1	0.1	1.5	0.5	2.5	2.0
Barley	1.5	1.4	1.5	na	0.0	0.0	0.0	0.0
Total	17.98	16.15	5.85	na	1.56	0.72	0.78	na

Sources: USDA, WASDE database. Data on a marketing year basis.

chloride(2.04milliontons nutrient-weightbasis);420,000 tons of potassium sulphate; 7.2 million tons of compound fertilizers(4.6milliontons nutrient-weightbasis);and 1.49 million tons of other chemical fertilizers not specified. In 1996, China's chemical fertilizer imports accounted for about one-fourth of domestic consumption. In this case authorities encouraged fertilizer imports to support the "grain bag" responsibility system and to be less dependent on foreign sources of grain.

Conclusion

Two questions are addressed in this review of the "grain bag" policy. First, there is the question of how the "grain bag" policy was actually implemented. How well were policy objectives met? Second, there is the question of whether the "grain bag" policy, which stresses self-sufficiency, serves China's long-run interests.

Many "grain bag" Policy Objectives Achieved

Table 12 below summarizes our preliminary assessment of how the "grain bag" policy objectives were achieved. At present, our general conclusion is that governors implemented the prescribed policies: grain area rose, grain output increased, and urban areas had adequate supplies of grain.

Self-sufficiency Versus Participation in International Trade

The implementation of this policy indicates the government's emphasis on grain self-sufficiency, intervention and control of the grain economy, and reassertion of its old objectives to support its urban constituents. And in a like manner, it indicates a turning away from emphasis on comparative advantage in production decisions, economic efficiency, participation in world grain markets, and open domestic markets. Given China's large population and limited arable land, it is likely that in the next decade or two China will begin to pursue a strategy of producing agricultural products which use less land and more labor. For example, China could produce high value fruits, nuts, vegetables, specially processed foods, condiments, and specialty meat products for both the domestic and international mar-

ket, and could import land-extensive crops such as grains and oilseeds. The "grain bag" policy arrests this fundamental adjustment. Currently, the costs may not be very great, but over many years the adjustment may be very costly for China.

Perhaps central leaders hoped their "grain bag" policy would support economic trends toward greater market involvement. But, in fact, some governors pressed the policy down their administrative structure to prefecture, then to county, and to township. These measures would certainly stress local self-sufficiency. The "grain bag" policy appears to have been successful in raising grain output, but it would be foolish to think that the increase has come at little or no cost. This policy has arrested economic factors encouraging farmers to specialize in producing labor intensive horticultural crops where China has a comparative advantage. The policy encourages farmers to raise land extensive grain crops in which China has less advantage.

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Table 12--Summary of grain bag policy objectives and results for 1995 and 1996.

Grain Bag Policy Objective	Results for 1995	Results for 1996
1. Stabilize or Increase grain area	Grain area increased	Grain area increased
2. Increase supply of inputs (chemical fertilizers)	Increased 8.1 percent	Increased 7.1 percent
3. Raise yields	Increased from 4.06 mt/ha to 4.25	Increased
4. Increase grain production	Increased 4.9 percent	Increased 4.9 percent
5. Guarantee grain stocks	Increased 25 million tons	Increased 52 million tons
On-farm stocks	Increased	Increased
6. Enforce grain transfers	NA	NA
7. Stabilize grain supplies for urban residents	Yes	Yes
8. Stabilize grain and oil prices	Partial	Partial
9. Raise government share of commercial grain sales	NA	NA
10. Central government control over grain trade	Yes	Probably
11. Raise level of grain self-sufficiency	Increased from 96.3 percent in 1994 to 96.7 percent in 1995	Self sufficiency of 99 percent

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Good Grain Crop Projected for 1997

A record grain crop in 1996 and falling grain prices likely will mean reduced area sown to grain crops for 1997. While China's officials will push farmers to maintain grain area, farmers likely will only partially respond, and grain output for 1997 is forecast down from the record 490-million-ton crop for 1996. Net grain imports for 1997/98 likely will parallel the 0.9-million tons for 1996/97. This change is dramatic from the 16.5 million net imports of 1995/96. [Frederick W. Crook (202) 219-0002]

Grain output for 1997 likely will decrease from the 1996 record 490-million-ton crop. Government and on-farm grain stocks rose in 1996 and grain prices fell toward the end of that year. Policy makers are maintaining pressure on farmers to hold grain area steady, but area sown to grain likely will fall. In 1997/98, China likely will be a net importer of wheat and rice but will be a net exporter of corn.

Area sown to grain for 1997 is projected to fall slightly. Wheat and soybean area likely will expand while rice and corn area likely will decrease. The Economic Research Service projects a total grain crop of 475 to 485 million tons for 1997. This output includes wheat, rice, corn, sorghum, millet, barley, oats, soybeans, potatoes, and pulses (China's definition of grain).

Output for 1996 was 490 million tons, up 5 percent from the 1995 crop of 466 million tons as yields increased by 4.2 percent and grain area increased by 1.1 percent. With regard to overall grain consumption, the State Statistical Bureau's (SSB) Statistical Yearbook, 1996 provides the most up-to-date data. Real urban living expenditures increased from 446 renminbi (RMB) in 1981 to 3,538 RMB in 1995. In the same period, data from the SSB urban household income and expenditure surveys show that urban per capita grain consumption decreased from 145 kilos in 1981 to 97 kilos in 1995.

China's planners published targets for the last year of their Ninth Five-Year Plan (FYP) (1996-2000). The total grain production target is 500-515 million tons, 10-25 million tons above the 490-million-ton figure for 1996.

Through the year 2005, China's total grain output is projected to rise primarily because of yield increases. The government will try to increase the rate of yield growth by increasing investment in such things as agricultural research and technology, seed development, pest control, and irrigation and drainage. Grain consumption is projected to rise faster than production so that China's grain exports likely will decrease and imports likely will rise.

Wheat Output Forecast To Increase in 1997

Wheat Outlook for 1997/98

Wheat output for 1997 is projected at a record 114 million tons, 3.7 million tons more than the record 1996 crop. Under the "grain bag" responsibility system pro-

vincial governors in fall 1996 used administrative and price mechanisms to encourage farmers to increase area sown to winter wheat. The State Statistical Bureau's 1997 survey of planting intentions suggests farmers have planted or will plant more wheat in 1997 than in 1996 by about 500,000 hectares. Farmers in south China who in the last few years left their land fallow to work in more lucrative jobs in towns and villages are now being encouraged to increase the area sown to winter wheat (3). Yields are projected at a record 3.8 tons per hectare.

In an effort to encourage farmers to raise more wheat and to increase farm income, authorities raised the government's fixed-quota price from US\$131 in January 1995 to US\$160 in June 1996. For 1997, government authorities are holding steady the fixed-quota price for wheat. From July 1994 to spring 1996, there was a substantial US\$30 to US\$80 gap between the fixed-quota price and market prices. But with the increase in the fixed-quota price in spring 1996 and the record 1996 crop, the gap closed (see figure 12).

World prices (as represented by U.S. f.o.b. hard red winter, No. 2, Gulf ports) have been well below the domestic market price (figure 12). The gap narrowed in spring 1996 and exceeded the domestic market price from March through June, when world wheat prices soared. However, by September, the U.S. export price was again well below China's domestic market prices for wheat and remained so through the end of 1996.

Urban retail standard wheat flour prices rose about 10 percent in calendar year 1996, rising from 2,690 RMB per ton in January to 2,960 RMB in December.

Wheat imports for the July/June 1997/98 year are projected to increase by 0.5 million tons to 3.5 million. Imports are projected at a low level compared with 12 million tons in 1995/96 because of large domestic stocks and a record crop in 1996 and another record crop in 1997. Imports will help meet consumer demand for higher quality and specialty wheats, and to overcome domestic transportation constraints.

China's Wheat Outlook to 2005

Up to 2005, China's wheat output is projected by the United States Department of Agriculture (USDA) to increase at an annual rate of about 0.6 percent from a base in 1997. While area is projected to fall 0.1 percent a year, yields likely will increase at a much faster pace of around

Figure 12

China's domestic wheat prices and the U.S. HRW FOB Gulf price compared

RMB/metric ton

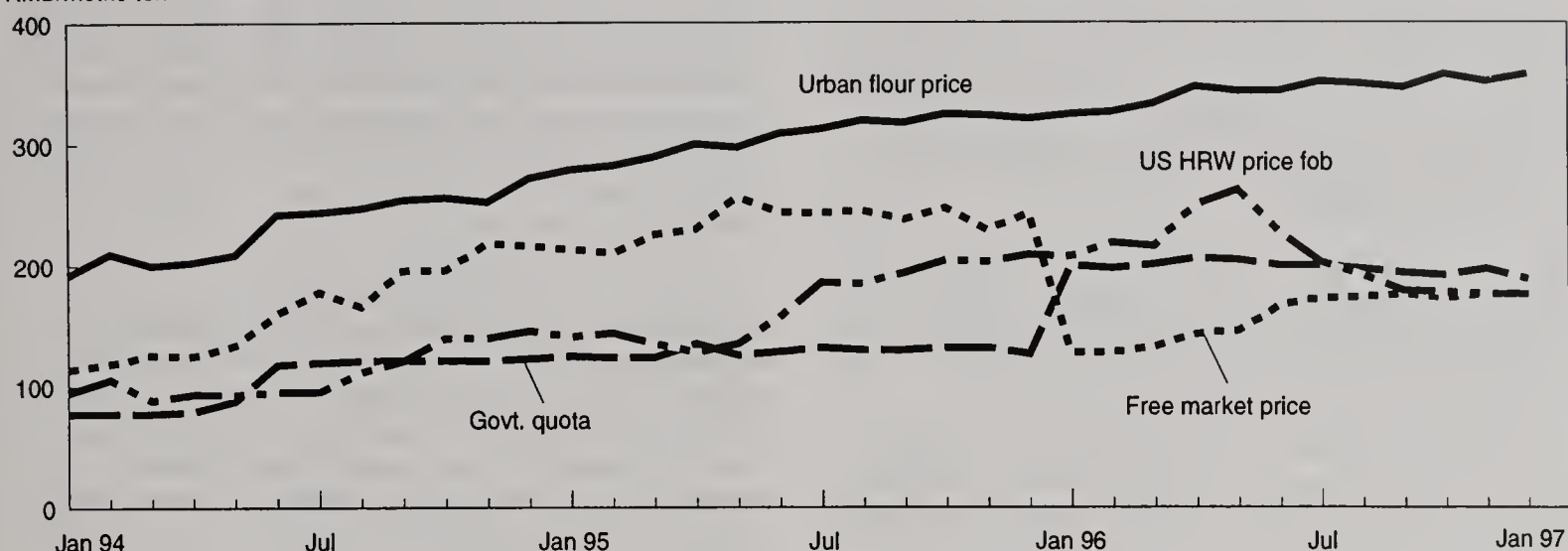


Table 13--China's grain production, trade, and stocks

Item	1995/96	1996/97	1997/98
Million metric tons			
Total grain (Jan/Dec)			
Production 1/	466.81	490.00	475-485.00
USDA definition 2/	226.72	249.63	na
Imports	15.94	5.90	na
Exports	0.86	3.50	na
Stocks	78.89	87.95	na
Wheat (Jul/Jun)			
Production	102.00	109.00	114.00
Imports	12.10	3.50	3.50
Exports	0.30	0.20	0.20
Stocks	23.73	23.03	25.83
Rice (Jan/Dec)			
Production (paddy)	185.22	191.00	na
Imports (milled) 3/	0.85	0.75	na
Exports (milled)	0.30	0.75	na
Stocks (milled)	21.46	23.21	na
Corn (Oct/Sep)			
Production	112.00	128.00	122.00
Imports	1.48	0.05	0.05
Exports	0.23	2.50	2.00
Stocks	32.70	41.00	37.00

1/ Wheat, rice (on a paddy basis), coarse grains, soybeans potatoes (grain equivalent weight using a 1:5 ratio of grain to raw weight), pulses and other grains are included in total grain.

2/ Wheat, milled rice, corn, sorghum, millet, and oats.

3/ For the 1995 rice marketing year, trade data are for calendar 1995.

Source: USDA PS&D database.

0.8 percent a year. China's seed breeders have developed several hybrid winter wheat varieties that are being field tested in major winter wheat producing provinces. In 1995, the Ministry of Agriculture test results showed yield increases of 25 percent, but it remains to be seen how these new varieties will perform in field tests (5).

Rapid economic growth rates, rising incomes, and changes in consumer preferences for quality wheat products, and a projected population growth of 100 million for the coming decade, will boost domestic demand above production. Rural per capita consumption of wheat is expected to continue to rise. But urban per capita consumption is expected to decline as residents continue to diversify their diets.

USDA projections place China's wheat imports in 2005/06 at about 15 million tons, compared with an average of 9.8 million tons during the Eighth FYP (1991-95) (7).

Wheat Situation in 1996/97

Area increased by more than 700,000 hectares to 29.6 million, and yields increased 5.4 percent to 3.73 tons per hectare in 1996 (appendix table 1). Wheat production was up 8 percent in 1996/97 (table 1) and imports fell by 75 percent. There are several factors behind the decrease in imports for 1996/97. First, the world price for wheat during some months in 1996 was considerably above China's domestic open market price. Second, domestic wheat production in 1995 and 1996 were record crops which boosted domestic supplies and stocks. Third, the government's "grain bag" policy encouraged increasing domestic grain production and reducing dependence on wheat imports.

Record Rice Crop in 1996, Lower Output for 1997

Outlook for 1997

Rice area for 1997 will likely be less than the 31.4 million hectares for 1996. The tendency to decrease rice area in favor of more profitable land use such as raising vegetables, fruits, and economic crops, will not fully offset the government's "grain bag" policy in which provincial governors are required to maintain area sown to grain (see section on agricultural policies).

Yields are expected to be about the same as last year at 6.1 metric tons per hectare. Government officials will implement measures to insure input supplies, but farmers facing low rice prices may tend to skimp on inputs for 1997.

In China's rice marketing year 1995/96, the first year indicates the marketing year, e.g., 1995 represents rice output for 1995 which is marketed in 1996. Rice imports are likely to be about the same as for the previous year and will include both high-quality varieties from Thailand destined for high-income urban residents and lower quality varieties for the urban poor. Imports for 1996/97 are forecast at 600,000 tons. China's rice exports are expected to rise to 750,000 tons in 1996/97.

Outlook for 2005

China's rice output by 2005 is projected to decrease at an annual rate of 0.4 percent a year. Area sown to paddy likely will decrease slightly (-0.4 percent) because returns from rice cultivation are projected lower than other uses, but yields are expected to increase 0.9 percent a year. Because of the under reporting of cultivated land and the over reporting of yields, actual yields are below reported yields. We believe there is some room for rice yields to increase.

China's rice exports are projected to increase slowly from around 300,000 tons in 1995/96 to 400,000 tons in 2005/06. Some of these exports will be japonica rice

shipments to East Asian neighbors and some exports of indica rice will be shipped to Asian, African, and European markets.

Rice imports are projected to increase from 850,000 tons in 1995/96 to 1.5 million tons in 2005/06. Demand for rice imports will increase largely because of rising urban incomes as consumers seek diversity and high-quality rice. But these imports likely will also include some lower quality rice to supply the requirements of lower income consumers in big cities.

Consumers in urban areas are eating less rice and more meat, fruits, vegetables, and wheat products. High income urban residents tend to shop for their rice in open free markets where they can purchase fresh domestic and imported rice varieties. Local government institutions provide subsidies for the urban poor and supplied fixed quantities of lower quality rice at fixed prices. China has been importing both low and high quality rices to supply two very different markets in urban areas.

Rice consumption trends in China parallel those in Korea and Japan where one can observe static or falling per capita rice consumption. China's consumers seem to be following in the footsteps of their East Asian neighbors such that as per capita incomes rise, and more foodstuffs are available domestically, families tend to reduce rice consumption and eat more wheat products, meat, fruits, and vegetables.

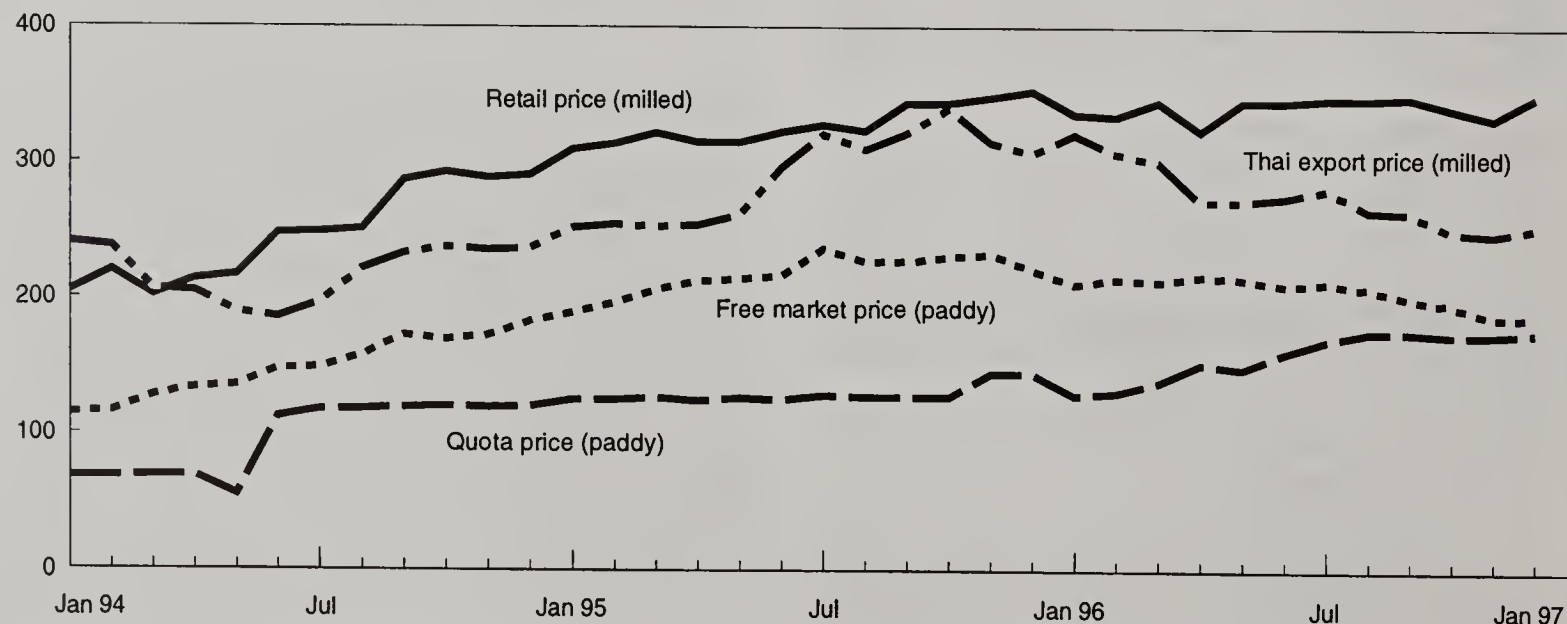
Record 1996 Rice Crop

Rice output for 1996 was 195 million tons (paddy basis), up 5.3 percent from the 185-million-ton 1995 crop (appendix table 1). The primary reason for the increase stemmed from a 2-percent increase in area and a 3.2-percent increase in yields. For a detailed examination of China's four major rice crops: indica early crop; indica single and late crop; northern japonica crop; and single and late crop japonica, see the article "China's Rice Economy Segmented into Distinct Markets,"

Figure 13

China's domestic rice prices and Thailand's rice export price compared

RMB/metric ton



published in *Rice: Situation and Outlook Yearbook*, USDA, ERS, Washington DC, November 1996. The japonica crop accounts for about 27 percent of China's total rice crop, while indica crops account for about 73 percent.

Urban retail prices for japonica rice fell from 3,480 RMB per ton in January to 3,210 RMB in December. Urban retail prices for indica rice fell slightly from 3,040 RMB in January to 2,970 RMB in December 1996 (figure 13).

In March 1997, we visited with researchers in China and found that the area sown to the early rice crop in 1996 rose slightly to nearly 8.3 million hectares and output increased to about 44 million tons, up a few percentage points from 1995. Consumers in southern China prefer the taste of middle and late rice crops and discriminate against early crop rice. Typically, farmers in southern China sell a large share of their early rice crop to fulfill their annual procurement quotas. Of the remainder that farmers retain on hand, we believe a large portion is fed to livestock. The state-owned Grain Bureaus purchase the early rice from farmers and, because of low demand for the crop, the Bureau puts a large portion in storage bins. Again, we believe some of this grain is fed to livestock, some is used in producing beer and pharmaceutical products, and a minor portion is used for table rice.

In March 1997, we traveled to Yunnan province and found that the province previously produced mostly indica rice, but now about two-thirds of the province's rice output comes from japonica crops. There is considerable competition in rice markets in the province at the present time for quality rice. State owned and private millers are competing to produce more attractive products for consumers: more highly polished rice, vitamin enriched rice, improved packaging, and brand names of rice varieties by location (3).

China's rice imports soared from 700,000 tons in 1993/94 to 2.0 million tons in 1994/95 but fell to 850,000 tons in 1995/96. China's custom statistics report that Thailand and Vietnam were China's prime rice suppliers in 1996.

China's rice exports dropped sharply from 1.5 million in 1993/94 to 32,000 tons in 1994/95, but rebounded to 300,000 tons in 1995/96. The fall in domestic rice prices compared with world market prices made China rice more attractive to foreign buyers. According to China's Custom Statistics, most exports in 1996 went to Hong Kong, North Korea, Libya, Mauritius, and Russia (2). Most of the rice exports were of the indica variety.

Smaller Corn Crop for 1997/98

Outlook for 1997/98

The record 127-million-ton corn crop for 1996, the fact that the open market price for corn fell from US\$180 per ton in January to US\$165 in December 1996, and higher soybean prices, likely will mean that growers will reduce area sown to corn in 1997. Area is projected to fall by almost 1 million hectares to 23.5 million hectares. Area sown to soybeans, other oilseeds, fruits, and vegetable crops likely will expand.

In January 1997, the market price was only US\$7 above the fixed quota price (the price the government purchased corn from farmers according to contract).

Corn yields are projected at 5.19 metric tons per hectare, down from the record 1996/97 yield of 5.2 tons per hectare which is projected to make a crop of 122 million tons, more than 5 million less than last year. With large corn stocks in major producing areas, farmers had difficulties selling corn in late 1996 and early 1997. Given these conditions, farmers are less likely to allocate their labor so intensely in 1997 and likely will not apply as much chemical fertilizers and pesticides as they did the year before. Corn exports for Oct./Sept. 1996/97 are projected at 2.5 million tons. Major export destinations will continue to be South Korea, North Korea, Japan, Russia, Malaysia, and other Asian ports. Imports are projected at 50,000 tons.

Outlook to 2005

China's corn output is projected to reach over 150 million tons by 2005. Area sown to corn is projected to increase at an annual average rate of 1.8 percent and yields are projected up 1.9 percent. Rapid economic growth, rising incomes with consumer preferences for livestock products, and population growth during the decade likely will boost domestic demand above production. Corn imports are projected to rise from 1.5 million tons in 1995/96 to 8.9 million tons by 2005/06. Corn exports fell from more than 12 million tons in 1992/93 to an estimated 230,000 tons in 1995/96. China's corn exports are projected to decrease from 2.5 million tons in 1996/97 to 285,000 tons by 2005/06. Most of these corn exports will come out of China's northeast provinces which is China's main corn producing area and has good transportation links to Russia, Korea, and Japan (2).

Record Corn Crop in 1996

Corn output in 1996 was a record 127 million tons, up 13 percent from the 1995 crop. Area increased 7.5 percent to 24.5 million hectares. Large inputs of chemical fertilizer, especially phosphate fertilizers, supported the 5.8 percent increase in yields which reached an estimated 5.2 tons per hectare.

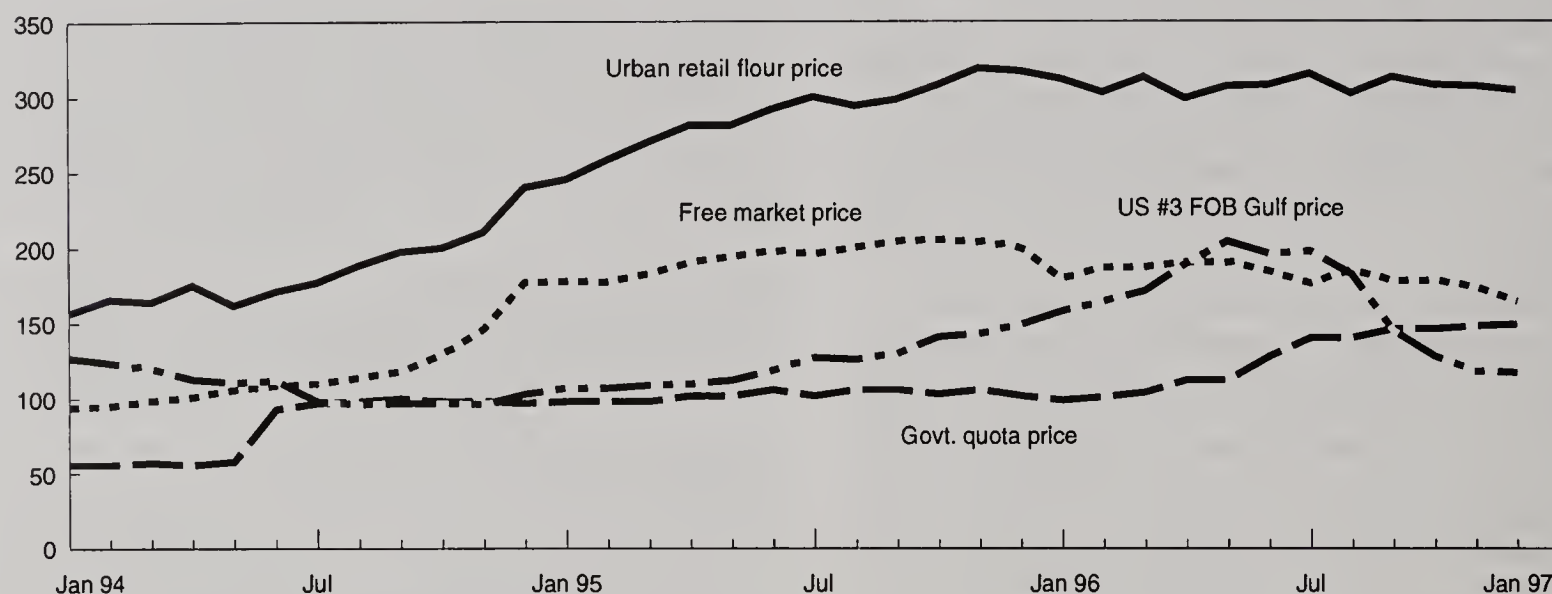
In 1993/94, China exported 11.8 million tons of corn with no imports. In 1994/95, however, China's corn trade shifted dramatically, with exports of 1.4 million tons but imports of 4.3 million tons. In 1995/96, China exported 227,000 tons while imports fell to 1.5 million tons. In 1996/97, corn exports are projected to increase to 2.5 million tons and imports to fall to 50,000 tons.

The switch from net exports to net imports and then back to a net exporter stems from several developments. First, earlier in the 1990's, the government reduced its subsidies for government grain companies holding corn stocks. This policy change encouraged firms to dump corn into the market which temporarily boosted supplies for livestock feed

Figure 14

China's domestic corn prices and U.S. #3 FOB Gulf price compared

US\$/metric ton



and for export. Second, government authorities boosted corn procurement prices in 1994 and 1995, which set off price increases throughout the corn economy (figure 14). Domestic corn prices quickly shot above the world price and corn exports declined. Third, the demand for livestock products, and consequently for feed, continued to rise rapidly because of increases in population and urban incomes. In fall 1994, foreign trade authorities issued instructions to ban corn exports, and in December China contracted to purchase corn on the international market. In 1995, China's state trading corporation COFCO (Cereals, Oils and Foodstuffs Import and Export Corporation, which used to be known as CEROILS) limited corn exports and purchased corn on the international market.

Interest in exporting corn resurfaced with the record 1995 corn crop and very high international corn prices in mid-1996, and China's domestic corn prices were below world prices. China could have exported large quantities at high prices but its leaders chose to limit exports, and within the policy guidelines set by the governor's "grain bag" responsibility system, transferred corn surplus northern provinces to feed grain deficit provinces in the south. With a record corn crop in 1996, along with full granaries and domestic prices just above the world price, China again has begun to export corn.

Barley

For 1996, USDA estimates that farmers sowed 1.3 million hectares of land to barley and harvested a 4-million-ton crop. Barley imports rose in 1996/97 to an estimated 2 million tons, up from the 1.4 million tons of imports in 1995/96.

New data from China permitted ERS to revise China's area and production of barley from the mid-1980s to the present (6). The general effect with respect to the previous estimates has been to increase the estimated area,

decrease the estimated yields slightly, and increase output slightly.

In calendar year 1996, China imported 1.3 million tons of barley, the same as in 1995. Most of the imported barley is for brewing purposes. Canada and Australia were the primary sources for these imports.

Little official data has been published regarding how China's barley supply is consumed. USDA estimates that about 40 percent of total barley supply is used to brew beer and 20 percent is used for animal feed. The remaining 40 percent is used for human consumption and for other uses.

Most of China's barley output comes from Jiangsu and Zhejiang provinces. Given the fact that both these provinces do not produce an abundance of feed grains, it is likely that a greater portion of total supply is used for feed and less for human consumption and other uses. Meetings with provincial officials in these areas suggest their barley crops are often harvested during the spring monsoon. The heavy rains often damage the quality of the barley, making it less useful as a grain for brewing beer.

Table 14--China's dry peas and bean area and output

Year	Area	Yield	Production
	1,000 hectares	MT/hectare	1,000 tons
1993	2,924	1.43	4,176
1994	3,515	1.41	4,958
1995	3,106	1.40	4,369

Source: China Agriculture Yearbook, various issues.

Beer production for 1996 reached 16.3 million tons, up 5.6 percent from 1995. The Ninth Five-Year Plan target is 20 million tons. ERS estimates that a good portion of early rice in grain reserves is eventually used to brew beer. In 1995 annual urban per capita beer consumption totaled 5.8 kilograms.

Dry Peas and Beans

Area and production data for dry peas and beans have only been published since 1994 as follows.

Dry pea and bean exports rose from 799,000 tons in 1993 to 1.5 million in 1994, fell to 1 million in 1995 and decreased to 576,000 tons in 1996. Two factors help to explain the decrease in exports. First, cadres implementing the "governor's "grain bag" responsibility system" may have put pressure on farmers to switch to wheat, rice, and corn whose yields are 4.3, 3.7, and 5.4 tons per hectare respectively, compared with 1.4 tons per hectare for dry peas and beans. If cadres pressed farmers to reach grain weight procurement quota targets, then farmers could have achieved those targets more effectively by planting corn rather than beans. According to SSB's *A Statistical Survey of China, 1997*, area sown to beans (soybeans and dry peas and beans) fell from 11.2 million hectares in 1995 to 10.6 million in 1996, a decrease of 600,000 hectares. A second factor is the rapid growth in domestic demand for direct consumption of dry peas and beans and indirect consumption of products made from peas and beans which gives consumers with higher incomes greater diversity in their diets. Also, with the growth in demand for livestock products, there has been a commensurate increase in the demand for protein meals. Some beans such as broad beans can be used as a protein meal. The fall in dry pea and bean exports may be in part attributable to decreased output and increased domestic demand for these products.

The first provincial level dry bean data was published in the *Agricultural Yearbook, 1996*. In 1995, broad bean area totaled 963,000 hectares and output totalled 4.9 million tons. Sichuan province produced 3.3 million tons, accounting for two-thirds of total output. Other major producers were Yunnan, Jiangsu, Hubei, and Gansu provinces. In March 1997, the author visited Yunnan province and found that broad beans, along with winter wheat, were the primary over wintering crops in the province. Local specialists and farmers reported that broad beans provide livestock producers with a good source of protein meal, the plant has nitrogen fixing properties, and farmers can feed the stalks to ruminant animals. The leaves of the plant and beans also can be eaten as a vegetable when green and tender.

Local officials reported that a portion of the dried beans are shipped out of the province for export. From 1991 through 1995, broad bean exports averaged 322,000 tons a year. But in 1996 exports dropped to 93,000 tons (see appendix table 11). Major export destinations include Egypt and Italy. One possible explanation for the fall in exports is that domestic demand for protein meals increased sharply in the last few years, and farmers and millers are beginning to use broad beans as a protein meal. In the past few years ERS analysts have visited a number of farms in Yunnan province and found farmers using broad beans as a protein meal (3).

In 1995, kidney bean area was 1.6 million hectares with output at 496,000 tons. Henan province is the largest producer with 145,000 tons. Other major producers are Jilin and Yunnan provinces. China exported an average 330,000 tons of kidney beans from 1991-95. In 1996, kidney bean exports dropped to 270,000 tons. Major export destinations include Cuba, South Africa, Pakistan, and Italy.

In 1995, area sown to meng beans totalled 1.4 million hectares and output reached 594,000 tons. Henan is China's largest producer of meng beans with 108,000 tons. Other primary producers include Jilin, Sichuan, and Shaanxi provinces. From 1991 to 1995, China exported an average of 118,000 tons of meng beans a year. For 1996, meng bean exports dropped to 81,000 tons. Major export destinations for meng and adzuki beans include Japan and South Korea.

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The Emergence of Private Rice Marketing In South China

A few years ago, the government-owned Grain Bureau had responsibility to purchase paddy rice from farmers, and transport, mill, and retail the milled rice to urban consumers. Now private entrepreneurs are undertaking many of the tasks performed by the Grain Bureaus. This article explains how private millers have been able to compete with the Grain Bureaus, producing a dramatic shift in the way rice is marketed in south China. [Xiao-peng Luo and Frederick W. Crook (202) 219-0002]¹

In 1996, soon after China's Government announced the price increase for the compulsory grain quota, the market price dropped below the new government prices. For the first time in more than 4 decades, the rice directly marketed by the farmers dominated all urban markets in south China. With prices down and sales to the government up, government stocks increased and exceeded storage capacity. These large stocks incurred huge financial costs and loss of rice through mildew and insect damage.

The Number of Private Rice Traders Increased Rapidly

The rapid growth of farmers' capacity to market rice surprised many people. Recent trips to south China revealed that private firms are now capable of participating in all major rice markets in south China with unprecedented efficiency. Rice produced in the traditional surplus provinces such as Anhui, Jiangxi, Hubei, and Hunan were first being husked locally, then shipped in large quantities by thousands of trucks to the market areas, such as Shanghai, and cities in Zhejiang, Fujian, and Guangdong provinces. The railway transportation bottleneck is no longer a constraint because of the competition from truck transportation. In the current price structure, the economic range for shipping rice by truck 300 to 400 miles depend on price differentials in different markets. Other motorized land and water transportation modes, including motorized junks, were also competitively used in marketing rice in different distances. For example, the rice produced in Anhui province, along the Yangzi river, was shipped by boats to ports along the river and southeast coastline such as to Fuzhou and Shantou, therefore competing with the rice produced in Jiangxi province transferred through railway and highway.

Since truck transportation can respond to market changes through overnight delivery, the price gap between any two rice markets were almost constantly within the range of transportation costs. Sometimes the intense competition actually drove the price gap between two trading areas to less than the transportation cost. In late December 1996, this was the case in Guangzhou (Canton) and Nanchang, the capital city of Jiangxi province. According to the Information Service of the State Administration of Grain Reserves, the price gap be-

tween the two rice markets was almost zero (figure 15). Interviews with private traders found that some traders from the Nanchang area sold their rice below cost in Guangzhou to preserve their market share.

Until 2 years ago, private trading firms' capacity for inter-provincial trade was limited. However, in late 1993 and early 1994, rice prices in south China rose rapidly and the state grain system delayed the release of the central reserve. This, together with policy reforms, opened the door for a dramatic expansion of private trade.

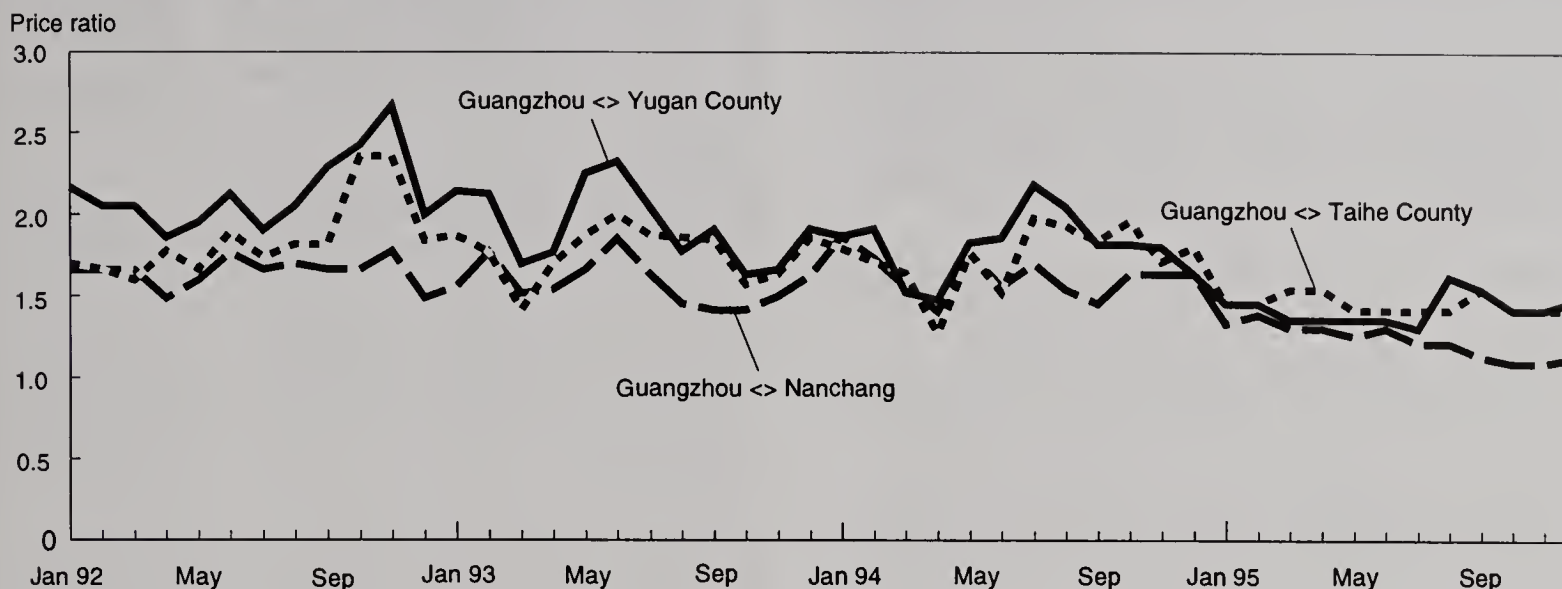
Private grain marketing had been suppressed for many years by the government. In 1978, when the reform started, the peasants were allowed to sell their grain products in local markets only after they fulfilled the compulsory quota. Beginning with the early 1950s, Government policy has never allowed private marketing to outplay the state grain system. In 1983 and 1984, when the success of the "household responsibility system" (or household land contract system) brought about nationwide grain surplus, the restriction on long distance trade for peasants was abandoned. However, when the market became tight in 1986, the practice of repressing peasant marketing was resumed. Since then, another two similar changes occurred as China's grain market experienced another two cycles from 1987 to 1996.

The recent growth of private rice marketing in south China has benefited from the interplay of some important policy reform and technical changes which have occurred in the last few years. The most significant policy changes favoring peasant marketing were: 1) the elimination of retail price subsidy for urban residents, 2) the elimination of planned transfers of grain among provinces, and 3) the decentralization and commercialization of the state grain system since 1993. These three policy changes created a much more open and competitive environment in urban areas. The original motive of these policy reforms was to reduce government fiscal burdens. Since the state grain system has monopolistic control over specialized storage facilities and enjoy other advantages in long-distance trade such as access to railway transportation, it was widely believed that private rice marketing would not threaten the dominance of the state system.

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Figure 15

Rice price ratio between Guangzhou and three Jiangxi counties



Trucks and Telephones Supported Growth of Private Rice Traders

However, two major technical changes occurred in the 1990s which favored private rice marketing. One change was the significant cut in the cost of truck transportation. The 'Dongfeng' truck powered by a diesel engine was developed in China in the early 1980s. It had a specified 5-ton load capacity, but the truck can actually carry more than 10 tons with minor adjustments in the suspension system. Since early 1990, the trucks were sold in large quantities to private individuals, and competition in truck transportation intensified. The inventory number of agricultural use trucks rose dramatically from 430,000 in 1985 to 790,000 in 1995. As a result, state-owned truck companies were almost wiped out, and the use of privately owned Dongfeng trucks increased rapidly.

The overall transportation cost has decreased as per vehicle load increased. In Jiangxi province, the price for truck transportation was 0.20 renminbi (RMB) per ton/km in the 1980s, but increased to about 45 cents in 1996 while the overall retail price more than tripled during this period.²

The real price of truck transportation, therefore, decreased by more than 30 percent. The economic impact of this change was immense. The railway transportation bottleneck in south China was broken and the real price of railway transportation also declined because of the competition with truck transportation.

For the first time in China's history, main surplus and deficit areas in south China were linked by competitive mechanized land transportation. For hundreds of years before modernization, rice markets in south China had been integrated by low cost water transportation. According to Professor Dwight Perkins, in the 19th century the price in the major deficit areas was about 30 percent higher than in the source area. However, in the early 1980s, the cost for ship-

ping rice by truck from the main surplus area to the main markets was even higher than 30 percent. Now, because of the technical change, the cost for shipping rice by trucks in the same range has dropped to less than 15 percent of the original price. The cost of railway transportation is still lower than truck transportation, especially for long distances, but there are some disadvantages for those private traders who had no access to storage in the consumer market area. From their point of view the railway system was less flexible. It did not give them the ability to time shipments and to choose buyers. Therefore, the railway system tended to bring higher price risk in a volatile market environment. Because most private traders do not have storage space in consumer market areas, rice marketing by private firms in south China is dominated by truck transportation.

The second technical change favoring private marketing in China has been the recent development of modern telecommunication systems in urban and rural areas. The latest computerized telephone exchange system spread rapidly throughout China. Now, most populated rural areas are not only linked with urban areas inside China but have links to the rest of the world. Consequently, all rice traders in south China have good information about prices from his sources and market areas. This progress greatly reduced the price risk for small traders.

The improved telecommunication system also has contributed to lower truck transportation cost because it helps to reduce one-way shipping (for example, reducing the number of empty trucks returning to Hunan province). In many cities of south China, there are telephone services which help returning truckers find freight to haul back to their home bases.

Organizational Structures Simple

The size and organizational structure of most private rice marketing firms in south China are very small and simple. The core of most firms is a small rice mill, typically with capacity of producing 1 ton of husked rice per hour. New

²One renminbi (RMB) or yuan in 1966 equaled 8.3 U.S. dollars.

rice mills cost about 55,000 RMB (US\$7,000), less than the cost of a middle-sized truck. Most firms have limited storage facilities in their rice mills. The firms usually are family owned or several partners work together, and these entities usually are located in rural market towns along the rice trading route. Some firms own one or more trucks, especially those firms founded by truck owners. Because truck transportation is always available, truck ownership has not been a condition for entry into this market.

The number of private rice trading firms has not been published, but a survey of seven towns in Jiangxi province revealed more than 200 private rice trading firms. The number of rice mills (private trading firms) tripled in the last 2 years. The processing capacity must be very large because the rice mills operated by the state grain system have almost closed down, so most demand for local consumption and shipping to other provinces have been met by small mills run by private firms. The number of small mills in Jiangxi province alone could be in the range of 2,000 with the capacity of processing more than 20,000 tons of rice each day. This estimate is very conservative because many mills owned by families were running under capacity even during the peak season of rice trade.

Private Grain Traders Hold Limited Stocks

The small size, low vertical integration, and vast number of these private trading firms are in sharp contrast not only with the state grain system in China, but also with the private trading firms in many market economies. The most striking feature of these private grain trading firms is that they hold extremely few commercial stocks. Most rice marketing firms are being run like the 'Just In Time' system invented by the Japanese Auto industry. The traders in surplus areas typically do not buy paddy rice from farmers until they receive an order from the wholesaler in the consumer market.

These organizational structures reflect the current social, political, and economic environment in China. The prominent feature of the environment is the high market risk associated with possible government intervention. Markets in surplus areas could be easily closed down by local government action in the name of protecting local interests or market stability. Or, market price in deficit areas can be affected by unpredictable intervention by local government such as importing from abroad or setting price ceilings. So keeping commercial stocks has been viewed as very risky for private traders.

On the other hand, once the market was opened by the government, grain was usually available, at least for peasant marketing as a whole. The second main feature of the market environment is that the aggregate level of grain stocks by rural households has been persistently high since the decollectivization (4).

Taking Jiangxi province as an example, the average year-end grain stock in the last decade, according to the government survey, was about 16 to 18 months of its own consumption when the next harvest was only 8 months ahead

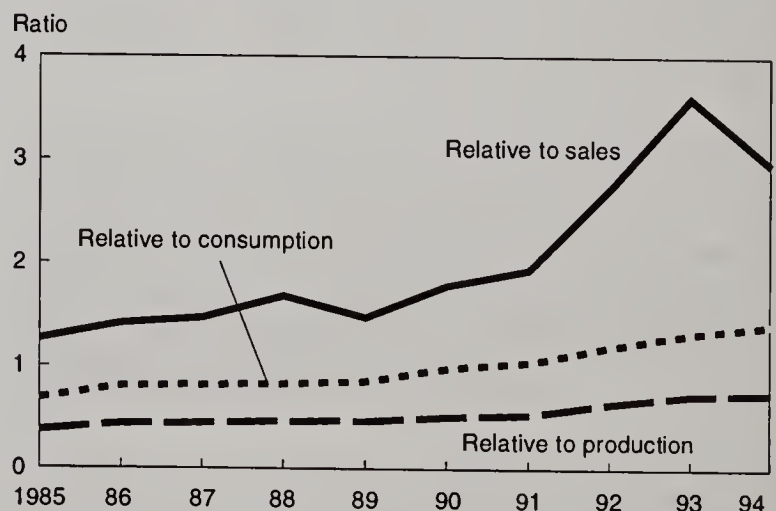
(figure 16). The potential marketable rice (unhusked) from all rural households was about 4 million tons, equivalent to the total compulsory quota in Jiangxi province. This amount is also about three times that of the yearly urban consumption in Jiangxi and two times the average yearly rice transfers to other provinces in the last decade.

The elimination of planned transfers between provinces in 1993 made the grain stocks by the rural households more exposed to the inter-provincial trade. The rapid growth of peasant's marketing capacity has been driven by this opportunity. A consequence of this process is that the state system began to lose its advantage in transporting and processing. The private firms increasingly gained business not only in the inter-provincial but also in the intra-provincial trade, because, under the financial pressure, more government grains were processed and transported by private firms. Even in the retail business, the market share by the state system has been shrinking steadily despite the lower farmgate price through compulsory quota. Besides the bureaucratic cost, the state system has to bear higher labor costs (including pensions for retired workers) and is subject to more stringent tax scrutiny. Therefore, when the new government purchase price squeezed out the implicit tax imposed by the compulsory quota, there was little room for the state grain system to stay in the rice market if the government does not want to subsidize rice retail sales.

The emergence of private firm rice marketing in south China raises a serious challenge to the longstanding assumption held by China's policy makers that private rice marketing could not handle the requirements of urban markets in this modern age. The recent development in the rice market of south China shows that the advances of modern transportation and communication technologies actually produced great opportunities for a highly decentralized marketing system. The private firms have been successfully taking advantage of this new opportunity. The current organizational structure of China's pri-

Figure 16

Ratio of rural household grain stocks to household production, consumption, and sales, Jiangxi Province, China



vate rice marketing is not yet mature, but it appears that private firms could well replace government marketing as a central player in China's rice market.

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China Becoming a Net Importer of Oilseeds, Oil, and Meal

As grains competed with oilseeds and other crops for land induced by high grain procurement prices, production of the four major oilseeds and hence, China's total oilseeds, declined in 1996. China will become a net importer of oilseeds, oil, and oil meal in 1996/97. While total oil imports in 1996/97 will be still lower than the level of 1994/95, oilseed and oil meal imports are expected to more than double. In 1996/97, the United States will reduce soy oil exports to China, but U.S. soybeans and soybean meal exports to China will increase. In the coming year, China will be a growing market for oilseeds and oilseed products. [Xinshen Diao, (202) 219-0690]

A drop in production of the three major oilseeds (cottonseed, rapeseed and peanuts) reduced China's total oilseeds production by 5.3 percent in 1996. Higher procurement prices for corn, rice, and wheat induced many farmers to switch cropland from oilseed to grain production. In 1997, total oilseed planted area and production will remain below 1995's record levels but higher than 1996's levels. In 1996/97, China made the move from being a net oilseed exporter to a net oilseed importer. Total exports of the top five oilseeds dropped, while imports rose. This trend will likely continue in 1997/98.

A major increase in soybean imports in 1996/97 will result in slightly increased oilseed meal production, even though total oilseed production declined. Demand for oil meal is increasing steadily. China has gone from being a net exporter of oil meal to a net importer. Estimated total meal imports will reach 3.3 million tons, and soy meal will continue to account for the bulk of the trade in oilseed meal.

Total vegetable oil production will decline by 48,000 tons in 1996/97 because of the large drop in oilseed production in 1996. It is forecast to recover only slightly in 1997/98. Consumption of oil is growing at a quick pace because of increased consumer and industrial demand. Total oil imports will increase in 1996/97 and again in 1997/98.

Major Oilseeds Production Down in 1996

Production and planted area of the four major oilseeds (soybeans, peanuts, rapeseed, and cottonseed) account for more than 95 percent of China's total oilseed area and production. In 1995, the share of each oilseed in total oilseed output was: soybeans, 31.3 percent; peanuts, 23.6 percent; rapeseed, 22.6 percent; and cottonseed, 19.5 percent. In the last 2 years, soybean output fell from 16 million tons in 1994 to 13.5 million tons in 1995 and 1996. For peanuts, rapeseeds, and cottonseeds, production in 1996 fell by 0.06, 0.61 and 0.88 million tons, respectively, from the previous year, compared with production increases in 1994 and 1995.

High grain prices induced many farmers in northeastern China's Heilongjiang province, where over a third of the country's soybeans are produced, to switch from soybean

to corn production. Soybean planted area in 1996 dropped about 4 percent from the previous year. Soybean production in other provinces was less affected by the increase in grain prices since the crop farther south is grown as a food staple rather than for crushing. With a 4.2-percent increase in soybean yields, soybean production kept at the same level of 1995. Declines in corn prices in 1996 and 1997 may cause farmers in the northeast to shift some of their land back into soybeans and hence, soybean production is expected to rise in 1997. However, it is highly unlikely that the recovery in soy-

Table 15--China's oilseed output and trade

Indicator	1994/95	1995/96	1996/97
1,000 tons			
Total oilseeds 1/			
Production	42,248	43,187	40,910
Imports	401	807	1,902
Exports	913	736	650
Soybeans (Jul/Jun)			
Production	16,000	13,500	13,500
Imports	155	795	1,900
Exports	394	222	200
Cottonseed (Oct/Sep)			
Production	7,704	8,440	7,560
Imports	5	2	2
Exports	15	10	10
Peanuts (Oct/Sep)			
Production	9,682	10,200	9,500
Imports	6	10	0
Exports	470	457	400
Rapeseed (Oct/Sep)			
Production	7,492	9,777	9,060
Imports	235	0	0
Exports	0	7	0
Sunflowerseed (Oct/Sep)			
Production	1,370	1,270	1,290
Imports	0	0	0
Exports	30	40	40

1/ USDA definition includes soybeans, cottonseed, peanuts, rapeseed and sunflowerseed.

Source: USDA PS&D database.

bean production will be completed given the greater income per hectare of corn. Corn yields are approximately 2.7 to 3.5 times higher per hectare than soybean yields, a fact that has brought corn farmers nearly 1.5 times more gross income per hectare over the past 5 years than they could have earned growing soybeans. Corn prices would have to drop dramatically to bring corn on par with soybeans, and this is unlikely given the current government's "grain bag" policy.

In addition to low returns from soybeans, farmers in Heilongjiang province are still reeling from provincial government policies that prohibited movement of unprocessed soybeans outside of the province. Implemented in 1995 to assist the provincial crushing industry, this policy not only caused prices to drop, but forced buyers to develop sources elsewhere. Despite the fact that the policy was partially abolished on January 1, 1997, farmers are still feeling the effects from imports.

The decline in rapeseed production stemmed from reductions in area as well as in yields. High rapeseed oil imports in 1994/95, and bumper crop production in 1995, drove up stocks of oil and seed, making it difficult for farmers to find buyers for their rapeseed. Also, rapeseed production is relatively labor intensive, and the field preparation is done in cold fall weather. Farmers have other options when the rapeseed price falls: working in township enterprises, planting winter vegetables, or staying at home. These, in tandem with high procurement prices for grains, induced farmers to decrease planted area by 3.4 percent in 1996. In addition, yields of rapeseed in 1996 fell by 2.9 percent from 1995's record. A decline in rapeseed stocks and a partial reduction in rapeseed oil stocks could induce area and production to recover in 1997. However, a complete recovery is unlikely because of continued high grain procurement prices.

Saddled with high production costs and low yields, peanut farmers in major growing regions also switched to raise other more lucrative crops. Peanut planted area fell by 1 percent. Insufficient sunshine in major producing provinces such as Shandong also accounted for some of the drop. The average yields of peanuts fell by 0.4 percent. Hence, the output in 1996 fell 0.6 percent to 10.1 million tons.

Cottonseed production suffered the biggest decline as farmers shifted away from intercropping wheat and cotton, to growing only wheat. Area declined from 5.4 million hectares in 1995 to 4.7 million hectares in 1996. This shift was brought about by high input costs, low procurement prices, and low returns. An additional decline in planted area in 1997 is expected for the same reasons.

China's switch from being a net oilseed exporter to a net oilseed importer occurred in 1996/97. Total 1996/97 exports of the top five oilseeds dropped to 0.65 million tons while imports reached 2.1 million tons. In the space of 3 years, China went from net exports of 1.6 million tons in 1993/94 to estimated net imports of 1.5 million tons in 1996/97. Soybean imports account for 99 percent of total oilseed imports.

Assuming import policies for soybeans do not change, the lucrative difference between home and foreign prices will further stimulate soybean imports (figure 17). At the beginning of 1996, China announced that it would implement tariff-rate quotas for several commodities, including soybeans. However, quota amounts were never announced, and the situation continued as before, with import licenses required but readily available. April 1, 1997 is the beginning of 1997/98's quota year, and there have been rumors that China would impose a restrictive quota on imports. The rumors caused imports to pick up prior to January 1, 1997 as importers tried to get product into China before the deadline.

Figure 17
China's domestic soybean wholesale prices and world market prices compared

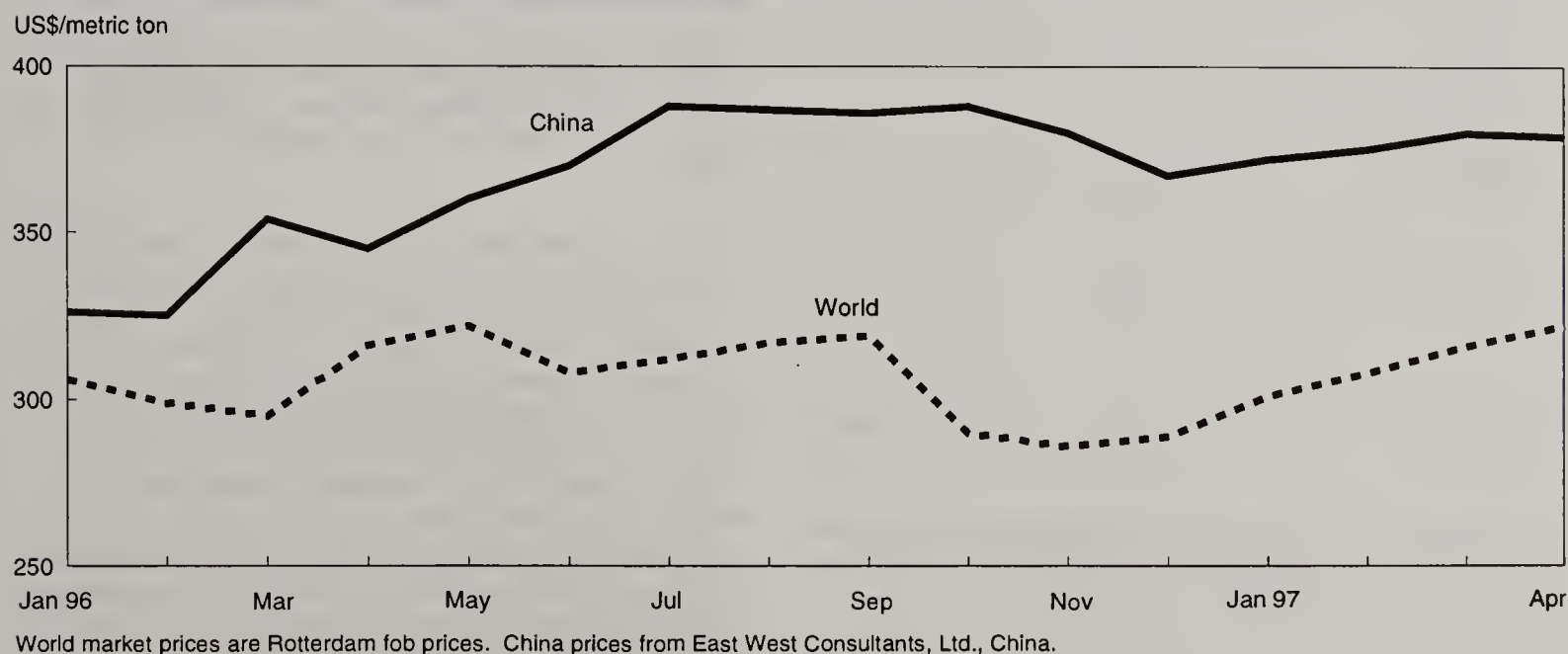
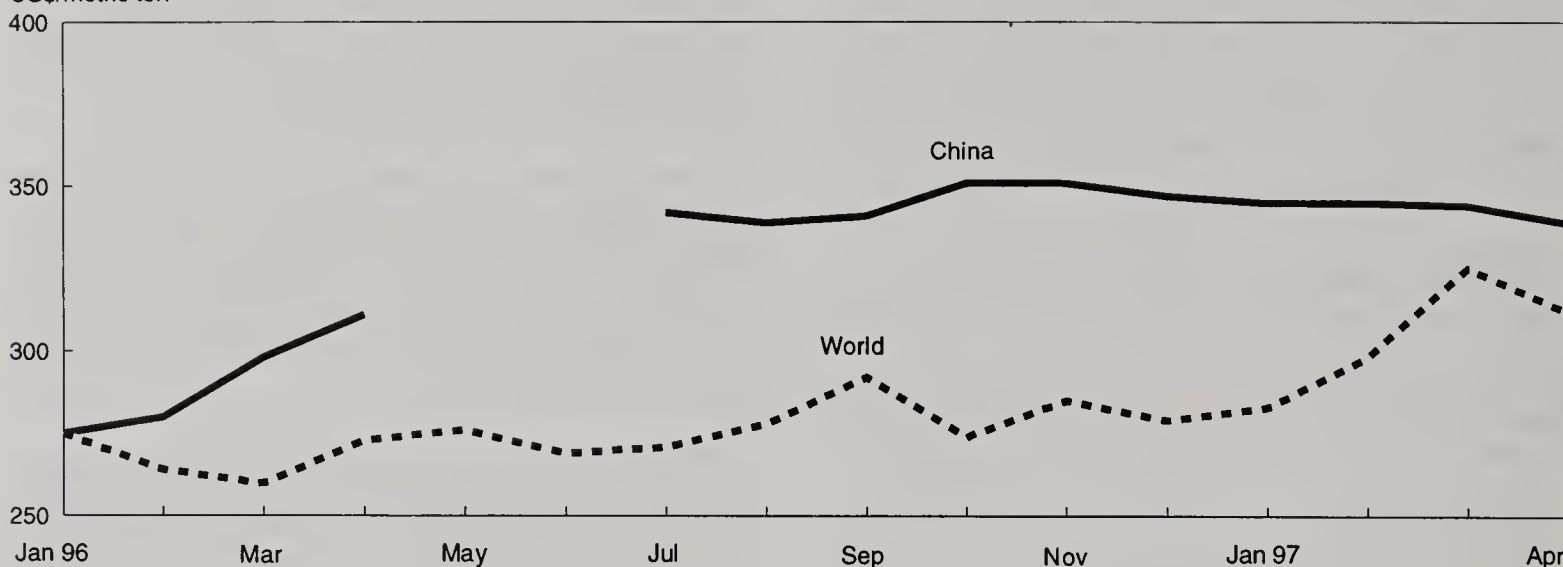


Figure 18

China's domestic soy meal wholesale prices and world market prices compared

US\$/metric ton



World market prices are Hamburg fob prices. China prices from East West Consultants, Ltd., China.

Table 16--China's meal output and trade

Indicator	1994/95	1995/96	1996/97
1,000 tons			
Total meal 1/			
Production	16,755	17,759	17,773
Imports	729	1,589	3,125
Exports	1,979	985	985
Soy meal (Jul/Jun)			
Production	6,554	6,038	6,885
Imports	50	929	2,500
Exports	1,275	100	100
Peanut meal (Oct/Sep)			
Production	2,165	2,285	2,197
Imports	0	0	0
Exports	38	8	10
Rapeseed meal (Oct/Sep)			
Production	4,311	5,452	5,071
Imports	11	0	0
Exports	86	307	300
Cottonseed meal (Oct/Sep)			
Production	3,113	3,344	2,914
Imports	0	0	0
Exports	500	490	500
Sunflowerseed meal (Oct/Sep)			
Production	542	470	476
Imports	0	0	0
Exports	80	80	75
Fish meal (Oct/Sep)			
Production	170	170	230
Imports	668	60	625
Exports	0	0	0

1/ USDA definition includes soybean meal, peanut meal, rapeseed meal, cottonseed meal, sunflowerseed meal, and fish meal.

Source: USDA PS&D database.

Peanut exports account for more than 60 percent of total oilseed exports. In 1996/97, peanut exports are expected to fall by nearly 13 percent.

Oil Meal Production Down; Imports Up in 1996/97

Total oil meal production will rise slightly in 1996/97 as soybean imports will offset the reduction in production. However, demand for oil meal is greater, and China will continue to be a net importer of oil meal in 1996/97. Total net imports are expected to amount to 2.44 million tons. All oilseed meal imports are soybean meal. Stimulated by the profit margin from the price gap between domestic and foreign meal, soy meal imports will soar to 2.7 million tons in 1996/97 (figure 18). With modest growth in domestic soybean and peanut production and growing demand for protein meals, 1997/98 is likely to see further growth in soy meal imports.

Oil Imports Keep Stable in 1996/97

With oilseed production down and weak returns for crushers because of large oil imports, vegetable oil production is down in 1996/97. Soybean and rapeseed production will rebound slightly in 1997, and increased soybean imports in 1996/97 and 1997/98 will increase crush. So oil production will rebound in 1997/98.

Lack of stock numbers for China oilseed and oilseed products make it difficult to estimate domestic consumption figures, but combined domestic production and imports of vegetable oil in 1996/97 showed an increase of 6.1 percent to 10.04 million tons. It is reasonable to believe that oil consumption is growing steadily and could reach about 9.54 million tons in 1996/97. Oil stocks, on the other hand, have fluctuated widely, beginning with an enormous accumulation of rape and soy oil in 1994/95 when oil prices were rising. These stocks have been reduced somewhat by the end of 1996, but soy oil stock is believed still high, as the wide gap (more than 50 percent) between domestic and international prices (figure 19) tends to encourage vegetable oil imports.

Table 17--China's main vegetable oil output and trade

Indicator	1994/95	1995/96	1996/97
1,000 tons			
Total oils 1/			
Production	5,964	6,653	6,430
Imports	4,431	2,811	3,432
Exports	574	391	481
Soybean oil (Oct/Sep)			
Production	1,214	1,147	1,309
Imports	1,702	1,445	1,500
Exports	89	66	150
Peanut oil (Oct/Sep)			
Production	1,354	1,430	1,374
Imports	18	5	5
Exports	13	6	6
Rapeseed oil (Oct/Sep)			
Production	2,295	2,904	2,700
Imports	944	303	375
Exports	242	119	125
Palm oil (Oct/Sep)			
Imports	1,667	1,006	1,500
Exports	230	200	200

1/ Percentage of each crop crushed for oil is given in parentheses. USDA definition of China's oil production includes oils crushed from soybeans (51%), cottonseed (83%), peanuts (59%), rapeseed (90%), and sunflowerseed (72%), while oil imports and exports include soy oil, peanut oil, rapeseed oil, palm oil, coconut oil, and olive oil.

Source: USDA PS&D database.

Oil consumption is growing because of increased consumer and industrial demand. Rising incomes have translated into higher per capita oil consumption, particularly in urban areas. Although China's Statistical Yearbook reported that oil consumption directly purchased by households have grown slowly in the last 5 years, consumption in work place cafete-

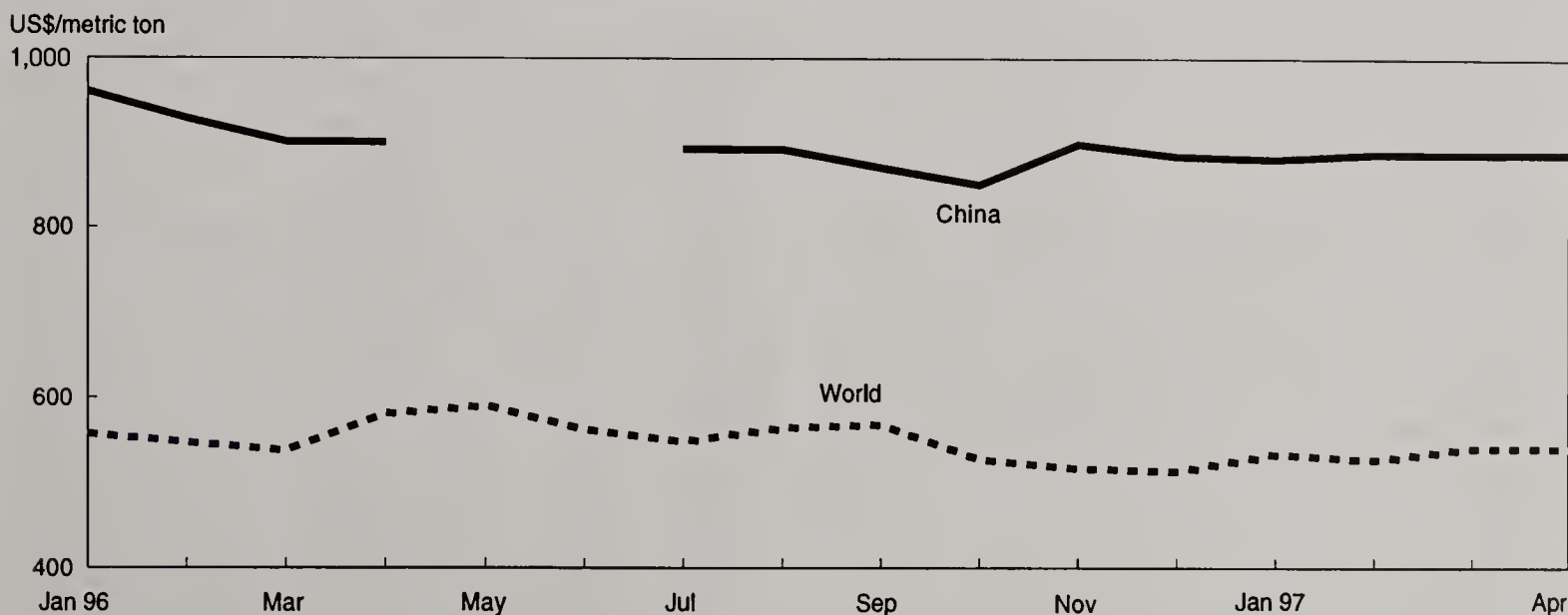
rias and restaurants is believed to have grown rapidly. However, non-home cooking oil consumption is not included in the household survey data, making it very difficult to estimate the total amount of oil consumption. Development of the domestic food processing industry (e.g., snack food and noodles) has also driven up oil consumption.

While China's consumers have traditionally preferred crude vegetable oil because "it has more color and flavor," preferences are changing. Urban consumers are increasingly choosing refined oil. In response, many crushers are converting some of their refining capacity over to production of high-grade salad oil, and advanced crushing equipment with larger production capacity has been installed. For example, Guangdong, the most open and fastest growing province in China, imported 0.5 million tons of unrefined palm oil in 1995/96, which was equivalent to one-half of China's imports of palm oil in that year. Most of the imports were used to produce high-grade refined oil.

China announced tariff-rate quotas on soybeans and selected oil at the beginning of 1996 but never announced annual quotas for implementation on April 1, 1996. Instead, it has maintained its old system of announcing quotas for specific oils as trade administrators deem necessary. Total quotas are not announced in advance but are issued piecemeal throughout the year. Last year, quotas for palm oil and soy oil were made available and not filled entirely. China has not announced its intentions with regard to quotas for the 1997/98 quota year yet, but industry experts speculate that China will continue issuing specific quotas and that larger quotas will be issued now that overall stocks have dropped.

By the beginning of 1997, palm oil stocks were low and soy oil stocks had dropped. While rape oil prices have rebounded in some provinces now that rape oil stock levels are down, stocks in other provinces remain high. This is be-

Figure 19

China's domestic soy oil wholesale prices and world market prices compared

World market prices are Dutch fob prices. China prices from East West Consultants, Ltd., China.

cause the price at which the oil was purchased almost 3 years ago is still above the market price, and those holding it are unwilling to take a loss.

Given these current supply and consumption trends and barring a change in China's policy of promoting grain production at the expense of oilseed production, total oil imports are expected to climb to roughly 3.5 million tons in 1996/97 and 1997/98.

In an effort to reduce smuggling of palm oil, China reduced tariffs on January 1, 1997, from 18 percent for crude and refined palm oil to 9 percent for crude palm oil and 12 percent for refined. Given that tariffs for crude palm oil are now below that of soy oil, the relative share of imports could change. With palm oil running at a premium, however, because of tight world supplies, the majority of imports in 1996/97 are expected to be soy oil.

Increased imports of soybean and soybean products by China created good market opportunities for U.S. soybean growers and soybean meal producers, but shipments of soy oil from the United States fell.

Outlook for 2005

Given China's food "self-sufficiency" policy, the government will continue to encourage grain production. By raising procurement prices of rice, wheat, and corn or increasing input subsidies in grain production, the profitability of grain will rise relative to non-grain crops such as oilseeds. Weak growth of oilseed output is one major potential risk of the government's current grain policy. ERS projects that total oilseed production will increase by 15 percent, while soybean production will increase by 19 percent between 1997 and 2005, slower than in the last 10 years.

On the demand side, however, demand for vegetable oil and oilseed meal will continue to rise. Vegetable oil for direct human consumption is expected to increase at 4-5 percent annually, while industrial consumption is increasing at a rate of 7-10 percent in the next 9 years. For oilseed meal demand, the proportion of processed feed used in animal rations, on average, is very low in China relative to other countries. Many farmers are still using straw and sweet potato greens, for example, for feed. With rapid growth of the feed industry driven by increased demand for meat, China will likely remain a good market for oil meal. ERS projects that oil meal imports will increase by more than 70 percent between 1997 and 2005.

To implement its grain policy, the government will continue to regulate grain and major nongrain crops' markets through trade restraints, controls on export/import rights of selected corporations and import quotas. These policies are expected to widen the gap between domestic and world prices for oilseeds and oilseed products for the next 8 years.

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Table 18--China's calendar year soybean and soybean product imports

Indicator	1995		1996	
	Volume	Value	Volume	Value
	Tons	US\$1,000	Tons	US\$1,000
Soybeans	293,938	75,488	1,107,539	320,348
United States	143,915	39,033	859,678	253,154
Argentina	93,680	23,703	117,987	34,574
Russia	40,801	8,018	66,275	11,973
Brazil	7,000	2,188	52,747	17,386
Canada	7,053	2,086	10,185	3,077
Soybean oil	1,481,813	1,023,914	1,295,396	764,488
Brazil	806,079	549,836	955,652	564,610
Argentina	93,182	64,246	172,633	99,995
United States	495,328	353,801	51,271	31,330
Soybean meal	1,003	195	1,876,478	519,545
Brazil	0	0	759,499	210,722
Argentina	0	0	578,838	156,233
India	0	0	399,128	113,799
United States	600	144	105,126	31,992

Source: China's Customs Statistics, 1995-96 (commodity code for soybeans 1201; for soybean oil 15071 and 15079; and for soybean meal 2304).

China's Cotton Imports Rise Despite High Stocks

China's 1996/97 cotton production fell 11.9 percent to 4.2 million tons. However, ending stocks rose 16.7 percent as imports continued at a relatively high level and offtake was sluggish. China's central government-dictated cotton import plan reportedly called for little in the way of cotton imports this year in order to draw down growing stocks. However, lower priced imported cotton, primarily from the United States, attracted many joint-venture cotton yarn mills to import. Although difficult to verify, many non-joint-venture yarn mills reportedly were able to illegally obtain this lower priced imported cotton, increasing the financial pressure on the China Cotton and Jute Company, the government's official cotton marketing and warehousing body. Area and production in 1997/98 are expected to decline because of relatively low incentives for cotton farmers and increased area planted to wheat. Imports are expected to remain robust barring a change in the right of joint-venture yarn mills to import cotton. The structural problems within China's textile industry are not expected to improve dramatically in 1997/98 as the central government continues to give more weight to the social and political impacts of large layoffs and bankruptcies against the need to restructure the perpetually money-losing state-owned textile sector. [Hunter Colby (202) 219-0669]

Area sown to cotton in 1997/98 is expected to fall modestly because of poor returns to cotton relative to other competing crops. Despite the fact that free market grain prices declined in 1996, the rising opportunity cost associated with planting labor-intensive cotton, particularly in North and East China where alternative low-labor crops or nonagricultural employment opportunities are much greater, is expected to reduce cotton area. The majority of those reductions will likely occur in North, Central, and East China growing areas. Northwest China, notably Xinjiang Province, will probably continue to increase area sown to cotton, but not enough to completely make up for the reduction in other regions. Given the difficulty of forecasting future yields or relative crop prices, arguments for significant increases or decreases in yield are premature. Assuming average yields and a modest reduction in area, production in 1997/98 may fall below 4.0 million tons.

Estimates of China's imports in 1996/97 are now higher than initial forecasts because of surprisingly robust cotton purchases by joint-venture cotton yarn mills. A significant

but unknown share of these imports, however, are reported to be finding their way to non-joint-venture mills (in many cases via state mills establishing so-called "joint-ventures"). Robust imports during 1996/97 have been stimulated by China's high internal price relative to the world price.

Cotton imports in 1997/98 are contingent on a number of policy issues facing the central government—issues about which very little information is as yet available on what, if any, changes the government may make. If there are no changes in policy, imports will likely remain close to 1996/97 levels. This "no policy change" scenario for imports assume domestic prices remain above world prices (meaning the world price doesn't fall and the government doesn't lower the state-set domestic price); no government clamp down on the right of joint-venture yarn mills to import cotton outside the state quota system; and finally, no push by central authorities to eliminate or diminish state yarn mills from gaining access to out-of-quota cotton imports via under-the-table transfers from affiliated "joint-ventures" established by the state enterprise. However, if any of the government policies identified above changes, it has the potential to substantially reduce China's 1997/98 cotton imports relative to the current year. In the past, government cotton policy tended to be announced following the August or September National Cotton Work Meetings involving all the government institutions involved in the cotton sector. With an internal price above the world price, China's exports are likely to remain nominal through 1997/98.

Table 19--China's cotton supply and utilization

Item	1993/94	1994/95	1995/96	1996/97
1,000 tons				
Production	3,745	4,333	4,768	4,202
Imports	176	884	663	544
Consumption	4,638	4,398	4,246	4,289
Exports	163	40	5	22
Ending stock	1,328	2,107	3,288	3,724
Percent stock/use	28.6	47.9	77.4	86.8

Source: USDA PS&D database.

Table 20--Monthly 1996 domestic cotton prices in China and the A index compared

US\$/ton	China's farm price	China's mill price 1/	A Index
	US\$/ton		
Jan	1,690	2,412	1,897
Feb	1,687		1,905
Mar	1,679		1,834
Apr	1,665		1,828
May	1,672		1,835
Jun	1,663		1,825
Jul	1,667	2,115	1,757
Aug	1,681	2,551	1,682
Sep	1,670	2,450	1,663
Oct	1,673		1,666
Nov	1,594		1,689
Dec	1,671		1,745

Sources: China's prices: China Ministry of Agriculture;

A Index: Cotton Outlook.

1/ Price paid by mills for cotton supplied by the state (Supply and Marketing Cooperatives).

Supply and Marketing Cooperatives Struggle

In 1996, the central government restructured the government cotton procurement agency—the system of Supply and Marketing Cooperatives (SMC). The system of linked provincial, prefectural, county, and local SMCs was restructured, with a national level office formed to oversee all SMC operations. The national level office reports directly to the State Council, giving the central government leadership greater control over cotton purchasing operations and activities.

Over the last 3 years, estimates of China's cotton stocks have increased strongly. From an ending stock-to-use ratio of 29 percent in 1993/94, the ratio has risen to 42, 64, and finally, 76 percent in 1996/97. Although some stocks are held by the central government for strategic reserve purposes and some by mills, the majority of cotton stocks in China are held by provincial Supply and Marketing Cooperatives. As cotton supply has grown over the last 2 years, yarn mills have gradually decreased their cotton stocks from 2-3 months of consumption to a reported 1-2 months at most. All of this means growing financial outlays for the government procurement and marketing agency. With both the farm price and resale price to mills mandated by the government at a level above the price of imported cotton, the Supply and Marketing Cooperatives have little room to maneuver to avoid stock accumulation and an attendant increase in carrying costs. Illegal price reductions and longer credit periods are reportedly the response of Cooperatives as they attempt to attract yarn mills who can now attempt to bargain before they buy domestic cotton.

Bollworm infestation continues to be a problem in several of the major producing provinces, most notably Shandong, Henan, and Hebei. Despite continued problems with bollworms, national yields rose slightly in 1996/97

Table 21--Provincial cotton area and output

Province	1994		1995	
	Area	Output	Area	Output
	1,000 tons			
Xinjiang	750	882	743	994
Henan	967	628	1,000	770
Hubei	498	450	502	586
Jiangsu	535	457	565	562
Shandong	793	559	666	471
Anhui	443	258	443	301
Hebei	685	390	701	370
Hunan	209	238	185	224
Jiangxi	163	175	132	119
Shanxi	129	85	127	91
All others	356	219	358	280
Total	5,528	4,341	5,422	4,768

Source: China Statistical Yearbooks.

due to unusually good weather during harvesting. National average yield in 1997/98 is expected to fall because of a return to more normal weather and also because of reduced incentives to farmers to increase fertilizer, pesticide, or labor inputs relative to other more profitable crops. However, over the long term, China is expected to gradually increase yields through additional improvements in pest management techniques, better varieties, and improved input quality and farm management.

Modest Consumption Growth Forecast

Cotton consumption is expected to rise in 1997/98 from an estimated 4.4 million metric tons in 1996/97. On a marketing year (August/July) basis through April 1997 (the most recent data available), monthly yarn output (including cotton yarn, synthetic yarn, and blended yarn) rose 7.8 percent compared with the same period the previous year. Yarn production is rising due to higher cotton supplies, bolstered by significant imports and plentiful domestic production, and reports of increased pricing flexibility on the part of the Supply and Marketing Cooperatives. Reports indicate that some Cooperatives are now selling cotton to yarn mills on the basis of 30-90 day extension of credit (rather than payment on delivery or 30-day credit). Other reports indicate cases where Cooperatives sell cotton to yarn mills at a discount to the official sales price mandated by the central government. Although technically not allowed, Cooperatives may be making a financial decision that it is better to take a manageable loss in selling the cotton "below cost" rather than the indeterminate loss incurred in holding the cotton in stock.

In general, the textile industry in China continues to suffer from rising input prices, very large debts, high operating margins, and growing competition for international markets from other textile producing countries. The large state-owned textile enterprises in China are in the most difficult financial straits, though recent press reports have attempted to claim an improvement as money-losing state-owned textile enterprises declined from 59 percent in the first quarter of 1996 to only 56 percent in

the same period in 1997. All of the difficulties in the state sector notwithstanding, China's total textile exports rose to US\$8.7 billion in the first quarter of 1997, an increase of nearly 36 percent over the same period in 1996. The 1.0 percent increase in consumption in 1996/97 and the rise in export value in early 1997 may be attributable in part to the government finally beginning to make good on at least a portion of the 3 years of accumulated export tax rebates (9 percent in 1996) owed to textile exporters.

Long-Term Import Picture

China's long term cotton trade outlook is for continuing imports and consistent, but small, exports. Cotton production is expected to increase gradually; although yields in China still have room to grow, rising domestic input prices and high competing crop prices will limit yield increases. On the demand side, consumption is also expected to increase gradually, but the rate of growth will be limited by a rising share of synthetic fiber in yarn production. Accordingly, assuming normal weather, China is expected to be a consistent net cotton importer, though occasional years of net exports are not impossible if optimal weather and policy conditions coincide. China's cotton imports are expected to be at

least 500,000 metric tons by the year 2005. Exports are expected to be quite low, but relatively stable, at roughly 40-50,000 metric tons in the year 2005.

Textiles and apparel account for roughly 30 percent of China's total export earnings. Officials in China indicate that the importance of the textile sector to the national economy means that the government will likely maintain more control over cotton than other agricultural commodities. However, as indicated earlier, growing financial pressure on the Supply and Marketing Cooperatives may move the central government to initiate some as yet unspecified reforms for cotton—the last remaining commodity where the government maintains tight control over domestic purchases, marketing, and distribution.

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Hong Kong

Despite the imminent change of government in Hong Kong on July 1, 1997, steady economic growth and expansion of agricultural imports continued in 1996 and are projected for the future. [Carolyn L. Whitton (202) 219-0825]

Government Change Imminent in Hong Kong

On July 1, 1997, Hong Kong's Government leadership and administrative personnel will change as Hong Kong officially becomes a Special Administrative Region (SAR) of the People's Republic of China. But under the 1984 joint Sino-British agreement, Hong Kong also is scheduled to maintain its free-port status and its commercial autonomy for 50 more years. As long as this is the case, Hong Kong's stable economic and agricultural import growth is likely to continue into the future.

After July 1, China will administer two Customs regimes, its own and Hong Kong's. And Hong Kong's exports to China will continue to face China's import duties for another 50 years, while China's exports to Hong Kong continue to reap the benefits of Hong Kong's free-port status. Hong Kong has no customs duties on most imports, only a 0.0035-percent declaration charge and small luxury duties on products such as alcoholic beverages and tobacco.

Economic Growth Continued Strong in 1996

Hong Kong's economic growth continues strong, promoting agricultural imports. Hong Kong's 1996 Gross Domestic Product (GDP) is estimated to have reached nominal \$155 billion, a real rate of growth of 4.7 percent over 1995, the same as 1995's expansion over 1994. While this is not the fastest economic growth among the rapidly expanding Asian economies, nevertheless it represents a healthy economy. The unemployment rate declined slightly and business confidence and investment remained relatively stable, despite the imminent new government.

Population continued to expand at an average annual rate of 1.9 percent to exceed 6.3 million people. Real per capita GDP growth slowed from 1995's 3.1 percent to 2.1 percent in 1996. But at 6.5 percent, inflation, represented by the consumer price index, declined from 1995, leaving consumers with more disposable income, and domestic consumption expanded somewhat faster than in 1995.

Agriculture is a minuscule part of Hong Kong's domestic economy. In 1996, agricultural production again accounted for only 0.2 percent of Hong Kong's total GDP.

Agricultural Trade Expanded

Hong Kong's 1996 total merchandise imports reached \$198 billion, up slightly from \$193 billion in 1995, and total exports (including re-exports) climbed to \$181 billion from 1995's \$174 billion. Re-exports accounted for \$153 billion or 85 percent of exports. Thirty-seven percent of Hong Kong's total imports

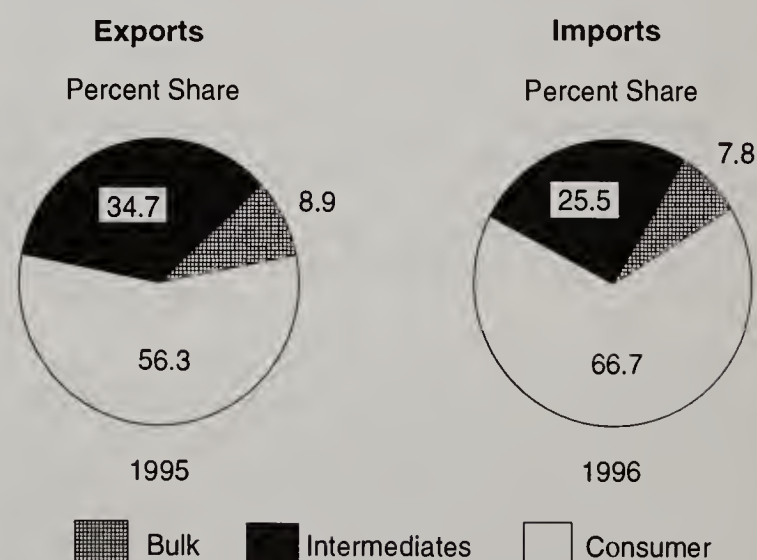
came from China, and a little more than one-third of Hong Kong's re-exports went back to China, about the same share as in 1995.

Its tiny agricultural sector and expanding domestic use leads Hong Kong to be heavily reliant on agricultural imports. The value of its 1996 agricultural imports equaled \$14.2 billion, 3 percent over 1995's \$13.8 billion, while agricultural exports (including re-exports) reached \$7.8 billion, compared with \$7.5 billion in 1995. Agricultural re-exports again accounted for nearly 90 percent of all agricultural exports and amounted to \$7 billion. The structure of Hong Kong's agricultural exports is dominated by consumer-ready goods (56 percent), while intermediate goods accounted for 35 percent. Bulk agricultural exports accounted for 9 percent of the total (figure 20).

But, despite the importance of agricultural imports to Hong Kong's well being, agricultural trade remains a small share of total imports and total exports. In 1996, Hong Kong's agricultural trade accounted for 7 percent of all imports, and just 4 percent of total exports. Consumer-ready agricultural imports accounted for two-thirds of total trade with intermediate products making up 26 percent. Bulk goods accounted for 8 percent of total agricultural imports. Fish dominated Hong Kong's 1996 agricultural imports (table 22). Fruits and vegetables, meats and products, and tobacco followed closely.

Figure 20

Structure of Hong Kong's agricultural trade



Source: Hong Kong Customs Statistics.

Table 22--Hong Kong's calendar year agricultural imports

Commodity	1995	1996
Million U.S. dollars		
Total agricultural imports	13,797	14,245
Total food & live animals	7,523	8,006
Live animals other	435	439
Meat & preparations	1,380	1,506
Dairy & bird's eggs	479	553
Fish & preparations	1,821	1,913
Cereals & preparations	453	512
Vegetables & fruit	1,628	1,669
Sugar, honey, & preparations	363	358
Coffee, tea, cocoa, & spices	242	250
Feeding stuff for animals	85	95
Miscellaneous edible products	636	712
Total beverages & tobacco	2,455	2,435
Beverages	1,053	996
Tobacco	1,402	1,439
Total crude materials, inedible*	3,269	3,232
Hides, skins, & furskins, raw	529	615
Oilseeds & oleaginous fruits	37	32
Crude rubber	372	349
Cork & wood	365	461
Pulp & waste paper	35	27
Textile fibers other than wool	1,343	1,188
Other	588	559
Total animal & vegetable oils, fats, & waxes	550	573
Animal oils & fats	11	13
Fixed vegetable fats & oils	517	542
Animal or vegetable fats & oils, processed	21	17

* Excludes fertilizers, minerals, ores, and scrape.

The United States accounted for 10 percent of Hong Kong's 1996 agricultural imports. Imports from the United States equaled \$1.49 billion, less than 1 percent below the \$1.5 billion imported from the United States in 1995, and the second largest of U.S. agricultural exports to Hong Kong since 1989. Hong Kong was the eighth largest market for U.S. agricultural exports in 1996.

At \$459 million, poultry and products again accounted for nearly one-third of U.S. agricultural shipments to the Territory (table 23). Fruits, vegetables, other meats and products, and tobacco accounted for much of the remaining U.S. exports.

Hong Kong's trend towards importing more high-value agricultural products continued as higher incomes encouraged a continued shift towards greater consumption of meats and fruits, both in Hong Kong itself and in neighboring areas of China proper, where much of these imports were re-exported. Continued growth in Western-style restaurants, fast-food chains, tourism, and Western-style supermarkets also contributed to rising demand for high-value agricultural imports.

Hong Kong remains a major hub of activity for regional trade because of its role as a transshipment center. For this reason, Hong Kong's agricultural exports, although not as large as its

Table--23 U.S. calendar year agricultural exports to Hong Kong

Commodity (f.a.s. basis)	1995	1996
Million U.S. dollars		
Total agricultural exports	1,503	1,490
Animals & animal products	621	685
Meats & meat products	90	115
Poultry & poultry products	433	459
Dairy products	27	40
Hides & skins, incl. furs	61	58
Other animal prods. & live animals	11	12
Grains & feeds	51	44
Wheat, flour & products	13	7
Rice, paddy, milled, & parboiled	1	2
Feed grains & products	3	1
Other grain & feed products	34	34
Fruits & preparations	193	205
Fruits, fresh	166	180
Fruits, dried, canned, frozen & other	27	25
Fruit juices, wine & other beverages	82	77
Nuts & preparations	46	51
Vegetables & preparations	130	176
Vegetables, fresh, frozen, & canned	58	71
Other vegetables, prepared or preserved	71	105
Oilseeds & products	75	66
Oilseeds & meals	18	17
Vegetable oils	56	49
Tobacco, unmanufactured	34	19
Cotton & linters	134	42
Sugar & tropical products	39	38
Sugar & other tropical products	12	12
Coffee, cocoa, & chocolate	12	15
Tea	15	12
Other miscellaneous vegetable products	72	62
All other agricultural products	27	25
Selected non-agricultural exports	208	194
Fertilizer	1	1
Fish & shellfish	46	53
Agricultural chemicals	16	20
Farm machinery	9	7
Tobacco, manufactured	135	113

agricultural imports, still are sizeable, despite its tiny agricultural output. Hong Kong's major agricultural exports in 1996 were tobacco and manufactures; textile fibers other than wool, meats and products, and fruits and vegetables also were important (table 24). And, Hong Kong's agricultural exports to the United States rose nearly 4 percent. Vegetables, processed grain products, and fish exports, again accounted for the majority (table 25).

Outlook for 1997

As long as no alterations are made in the implementation of the joint agreement for Hong Kong to become part of China on July 1, Hong Kong will remain a free-port until the year 2047, and economic growth is expected to continue while the rate of population growth is likely to gradually slow. Gains in per capita GDP ought to keep Hong Kong's demand for agricultural imports strong, and Hong Kong's agricultural imports are expected to continue expanding in 1997 and beyond. Rising incomes and changing diets, both in Hong Kong and in

Table 24--Hong Kong's calendar year agricultural exports

Commodity	1995	1996
Million U.S. dollars		
Total agricultural exports	7,450	7,813
Total food & live animals	2,742	3,147
Live animals other	14	6
Meat & preparations	410	710
Dairy & bird's eggs	198	222
Fish & preparations	578	583
Cereals & preparations	131	140
Vegetables & fruit	621	686
Sugar, honey, & preparations	187	175
Coffee, tea, cocoa, & spices	156	145
Feeding stuff for animals	52	43
Miscellaneous edible products	395	437
Total beverages & tobacco	2,075	2,173
Beverages	616	520
Tobacco	1,459	1,653
Total crude materials, inedible*	2,302	2,187
Hides, skins, & furskins, raw	254	246
Oilseeds & oleaginous fruits	24	14
Crude rubber	312	293
Cork & wood	272	314
Pulp & waste paper	84	53
Textile fibers other than wool	918	835
Other	438	433
Total animal & vegetable oils, fats, & waxes	331	305
Animal oils & fats	20	13
Fixed vegetable fats & oils	300	283
Animal or vegetable fats & oils, processed	11	8

* Excludes fertilizers, minerals, ores, & scrape.

Table 25--U.S. calendar year imports from Hong Kong

Commodity	1995	1996
Million U.S. dollars		
Total agricultural imports	93.43	96.86
Animals & products	5.33	5.90
Grains & feeds	10.75	11.36
Oilseeds & products	2.08	1.52
Fruits & preparations	2.53	3.29
Fruit juices	0.39	0.13
Beverages, excluding fruit juice	3.79	5.00
Nuts & preparations	2.41	1.44
Vegetables & preparations	52.33	48.60
Sugar & related products	1.67	2.78
Spices	1.86	1.97
Non-competitive spices	2.37	4.98
Tea	1.75	2.03
Drugs, crude natural	4.22	5.34
All other products	1.96	2.52
Selected non-agricultural imports	15.23	13.00
Fish	14.11	11.80
Agricultural chemicals	0.28	0.35
Farm machinery	0.43	0.46
Tobacco, manufactured	0.09	0.22

neighboring China proper, likely will continue promoting consumption growth, particularly growth in consumption of high-value products. High-value products will then remain Hong Kong's most important agricultural imports.

Other factors besides rising incomes and changing diets are also likely to continue supporting growth in high-value product import demand. These include: continued encroachment of other uses on Hong Kong's available agricultural land, expanded Western-style marketing, restaurant and fast-food growth, tourism, improved refrigeration techniques that lower prices, greater container capacity, enlarged or rebuilt port facilities, and expanding acceptance of frozen foods. And while a slow-down in growth of population expected in Hong Kong itself may weaken future import demand there, big gains in incomes and population in China proper may encourage Hong Kong to import more for re-export to China.

But if the joint agreement that returns Hong Kong to China July 1 is altered, and Hong Kong fails to retain its duty-free, commercially oriented economy, then Hong Kong's agricultural imports are more likely to decline, if for no other reason than a reduction in re-exports to China.

Introduction to China's Horticultural Economy

This paper briefly examines China's horticultural economy, production, marketing, processing, and trade. China is a major net exporter of various horticultural products, earning \$3.3 billion in 1995. A favorable climate and abundant labor force seems to have given China a comparative advantage raising horticultural products. [Frederick W. Crook (202) 219-0002]

China's horticultural economy (vegetables; tea, coffee, and spices; fruit; tree nuts; melons; and flowers), is an economy in which China may have comparative advantages with its varied agro-climatic regions, its limited arable land, and its abundance of labor. China's horticultural economy generated net exports of \$2.7 billion in 1994, and in 1995 net horticultural exports reached \$3.3 billion (table 26).

Vegetables

China's farmers plant a wide variety of tropical and temperate vegetables. Area sown to vegetables (including melons used as vegetables) more than tripled from 3.2 million hectares in 1980 to 10.5 million in 1996 (5, 7). Ministry of Agriculture statisticians are in the process of refining their vegetable output series. Their most recent estimate is that farmers produced 431 million tons in 1995; 257 million tons of fresh vegetables; 163 million tons of potatoes; an estimated 10 million tons of dry peas and beans; and 1 million tons of mushrooms (4), which makes China the largest vegetable producer in the world. In 1995, the United States produced 56 million tons of vegetables (including vegetables, potatoes, dry peas and beans, and mushrooms) (13).

All vegetable marketing was managed by the state before reforms were initiated in the early 1980s. But the number of rural open markets increased from nearly 37,000 in 1979 to 63,000 in 1995, and the number of open markets in urban areas expanded from 2,226 in 1979 to nearly 20,000 in 1995 (7). Since then, an increasing share of vegetable output has been delivered to consumers through markets (5). By 1993, state-owned vegetable companies in large cities controlled only 20 percent of vegetable volume (5). Farmers have responded to market signals to boost output. They invested in greenhouses to extend the growing season, constructed irrigation systems, planted varieties of vegetables demanded in the market place, and paid more attention to improving the quality of vegetables produced. Competition in the market place encouraged wholesalers and retailers that there were profits in delivering a fresh, wholesome, clean, appetizing product to consumers. In the past decade, the variety and quantity of vegetables available in the market place improved substantially (2).

Most vegetables in China are consumed in the fresh state. Processing and packaging facilities are the weak links between truck gardens and consumers. In the early 1980s, vegetables were delivered in bulk to city retail outlets. By the early 1990s, farmers and wholesalers had begun to put

fresh vegetables into net plastic bags. In 1996, products arrived in wholesale markets in rigid plastic boxes to protect the quality of vegetables. A traditional processing industry consists of drying and processing products like black ear mushrooms, huanghua, pepper, and chili. Each year, large quantities of vegetables are preserved through drying (5). China has a small frozen vegetable industry, but no annual output data was available. By 1979, China's canning industry produced about 160,000 tons of canned vegetables but by 1995, this figure rose to 660,000 tons (7).

Official statistics show that both urban and rural residents are consuming less kilograms of vegetables in 1996 than in the early 1980s. It is possible that consumers are shifting from bulky, lower quality vegetables to higher quality varieties.

China is a major exporter of fresh and preserved vegetables (table 27). Exports rose from 2.2 million tons (\$721 million) in 1986 to 3.1 million tons (\$2.4 billion) in 1995. According China's Custom Bureau, the top ten vegetable export markets in 1996 include: Japan (\$809 million); Hong Kong (\$160 million); Republic of Korea (\$82 million); the United States (\$44); Germany (\$39 million); Italy (\$35 million); Indonesia (\$34 million); Brazil (\$28 million); Singapore (\$25 million); and Russia (\$25 million) (9). Imports in 1995 totaled \$71 million—mostly dried legumes and dried cassava.

U.S. vegetable imports from China in 1996 totaled \$141 million, of which major items were dried and fresh mushrooms, water chestnuts, peas, and beans. U.S. vegetable exports to China totaled \$12.2 million in 1996, but some products were transshipped into China from Hong Kong. Major items included canned vegetables, frozen potatoes, and hops.

Tea, Coffee, and Spices

Area in tea orchards expanded rapidly from 486,000 hectares in 1970 to 1 million hectares in 1977. Since then, area increased slightly to 1.1 million hectares in 1995. Area increases in the early 1970s boosted output from 136,000 tons in 1970 to 252,000 tons in 1977, an increase of 85 percent. Tea orchards typically are planted in hilly areas which are not well suited to raise grain crops. Yield increases supported output growth in the late 1970s, 1980s, and early 1990s so that production reached 593,000 tons in 1996 (7). China produces several different kinds of tea. Output as a percentage of total follows: red tea (13.5%);

green tea (69.3%); Oolong tea (7.1%); Jinya tea (9%); and other tea (1.1%) (4, 5).

It is not entirely clear how farmers market their tea. In 1992, China's Tea Cooperative (Chaye Shehui) increased purchases of tea but purchases by the State Commerce and Cooperative entity (Guohe shangye) decreased. Of the 560,000 tons of tea produced in 1992, the State Commerce and Cooperatives purchased 300,000 tons (53 percent of production) (5). State Commerce and Cooperatives retailed 177,800 tons (32 percent of production). It is not clear what other marketing organizations purchased and retailed tea. There are two tea markets. One is the Shanghai International Tea Auction Centre and the other is the Hangzhou Tea Wholesale Market (5).

The Ministry of Internal Trade entities processed 162,269 tons of tea in 1993, up 13 percent from 1992. Presumably other business concerns (township and village enterprises, and private companies) processed the remainder (5).

Urban per capita tea consumption has remained fairly constant at around 0.24 kilograms per capita from 1985 to 1995 (6). Rural per capita tea consumption was 0.33 kilograms, 38 percent higher than urban areas (8).

China's tea exports have remained fairly constant from the mid-1980s, with 174,000 tons to 179,000 tons in 1994. On average, China exported \$350 million worth of tea a year. Major export destinations included Russia, Hong Kong, Japan, France, Pakistan, and Uzbekistan (1). China also imports a small amount of tea.

China produces a small amount of coffee, a little over 3,000 tons in 1995 (4). There are only a few areas which have good natural conditions to raise coffee. Also in 1995, China produced 23,000 tons of cinnamon; 21,000 tons of anise; 12,000 tons of hops; 10,000 tons of pepper; and 400 tons of vanilla (10).

Orchard (Fruit)

China's orchards include a wide variety of tropical and sub-tropical fruits such as bananas, citrus, mangoes, papayas, guava, and temperate fruits such as apples, peaches,

pears, and grapes (3). China has many hilly areas which have fairly good conditions for fruit production. As infrastructure improves, output will continue to grow. Agricultural reforms instituted in the early 1980s encouraged farmers to expand fruit production. Orchard area rose from 1.8 million hectares in 1980 to 8.1 million hectares in 1995, an increase of 350 percent (7). Fruit production increased dramatically from 6.8 million tons in 1980 to 46.5 million tons in 1996, a 583-percent increase. The United States produces more citrus and grapes than China, but China is a large producer of many varieties of fruit, and total output is nearly 70 percent larger than that of the United States (table 28).

Before 1980, state-owned or controlled enterprises handled fruit marketing. Supply and marketing Cooperatives played an important role in purchasing fruit destined for processing (5). They purchased fruit from farmers, consolidated the product, stored it, and transported it to state-owned, township, and village-owned processing plants. But as economic reforms were implemented, increasing quantities of fresh fruit were marketed through open markets. After reforms were implemented in the early 1980s, an increasing portion of fresh and dried fruits were marketed through open markets.

China's fruit exports from the mid-1980s to the mid-1990s continued at about 375,000 tons per year. While China exported a wide variety of fruit, apples, pears, and bananas made up the bulk of the trade which was shipped primarily to Russia, Hong Kong, Singapore, Malaysia, and Vietnam. The value of fruit exports in the same period decreased slightly from about \$270 million a year to \$200 million. China's fruit imports were \$32 million in 1994. Major imports are bananas, mangos, and guava from Burma, Philippines, and Vietnam.

Tree Nuts

China produces a wide variety of tree nuts such as pine nuts, hazelnuts (filberts), almonds, cashews, chestnuts, and walnuts, but data exist only for walnuts, cashews, and chestnuts (table 30). The state purchases some tree nuts through the branches of the Supply and Marketing Coop-

Table 26--China's horticultural product trade, 1994-95

Commodity	1994			1995		
	Imports	Exports	Net	Imports	Exports	Net
	\$ millions			\$ millions		
Vegetables	18	2,091	2,073	87	2,209	2,122
Spices	2	294	292	15	466	451
Fruit	41	223	182	69	307	238
Nuts	24	183	159	14	452	438
Flowers	6	24	18	12	44	32
Melons	0	8	8	1	20	19
Total horticulture	91	2,823	2,732	198	3,498	3,300

Source: China Customs Administration, Annual Customs Statistics, 1994-95.

eratives in rural areas. Also, some tree nuts are marketed through local open markets.

The quantity of China's tree nut exports has remained stable for the past decade at about 75,000 tons per year. But the export value of these nuts increased from \$130 million in the mid-1980s to \$170 million in the mid-1990s (1). In 1994, China's tree nut exports totaled \$182 million: shelled walnuts (\$27 million); chestnuts (\$80 million); Gingko (\$29 million); and pine nuts (\$27 million). Major export destinations included Canada, the United Kingdom, Japan, Hong Kong, Australia, South Korea, Singapore, and the United States (table 32).

China's imports of tree nuts increased from 10,000 tons (\$12 million) in the mid-1980s to 27,000 tons (\$24 million) in the mid-1990s. In 1994, major nut suppliers included: \$11.5 million of cashews from Vietnam; \$2.7 million of chestnuts from North Korea; and \$3.6 million of pistachios from the United States (1).

Melons

Melons, which are used as a fruit, are placed by China's statistical authorities in a special class by themselves (guo yong gua, and include watermelon, hami melons, muskmelons, and other melons) (3). Melons used as vegetables are included in vegetable statistics. Watermelons accounted for 77 percent, and muskmelon (tiangua) accounted for 15 percent of total melon area (3). China's melon exports and imports are small.

Urban per capita consumption of melons increased from 20 kilograms in 1985 to 23 kilos in 1994 (6). Rural household income and expenditure survey data does not include a category of melon consumption but the surveys did contain data for watermelons. Since watermelons account for 77 percent of total melon area, watermelons can be taken as a proxy for melon consumption. Rural residents consumed an average of 4 kilograms during 1994, which sug-

gests their consumption is substantially below that for urban residents (8).

Flowers

Neither nursery stock nor flower production, marketing and consumption data were found. The export of flowers (shrubs, nursery stock plants, and foliage) rose from \$6.5 million in the mid-1980s to \$44 million in the mid-1990s, more than a 6-fold increase. Imports of these materials increased even more rapidly, from \$627,000 in the mid-1980s, to \$12 million in 1995 (1).

Outlook

At present, China is a major world producer, consumer, and exporter of horticultural products. Output of most horticultural products expanded after rural economic reforms were instituted in the early 1980s. Given China's vast land area with a wide variety of agro-climatic growing regions, its large supply of a disciplined labor force, and expanding domestic economy, China's farmers producing horticultural products have good prospects to expand output into the 21st century. In fact, for most years since 1990, horticultural exports earned enough foreign exchange to cover grain imports. Whether or not horticultural trade will expand depends on government policy regarding food security issues, decisions to increase foreign trade protectionism, or expand policies to increase freer trade. It will also depend on China's ability to increase capacity to process, store, package, and transport horticultural products.

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Table 27--China's top vegetable exports, 1992-96

Item	SITC Code	1992	1993	1994	1995	1996
Million\$US						
Canned mushrooms	20031010	148	136	163	254	189
Broad beans	7135000	118	85	144	143	30
Dried broad beans	7133300	74	47	70	57	116
Dried sweet potatoes	7142020	73	43	52	6	2
Canned bamboo shoots	20059030	68	90	99	142	146
Garlic	7032000	68	111	76	80	92
Mushrooms preserved in salt water	7119011	62	49	98	83	64
Canned asparagus	20056010	60	76	80	89	73
Other dried vegetables	7129090	59	64	87	110	133
Other fresh and chilled vegetables	7099090	45	47	72	83	117
Other preserved vegetables	20059090	49	42	43	55	48
Other simply preserved vegetables	7119090	46	43	48	60	81
Other dried mushrooms	7123030	46	44	154	259	74
Frozen, other vegetables	7108000	36	55	86	93	110
Mushrooms	7095100	31	77	106	124	118
Mung beans	7133100	31	36	66	81	55

Source: China Customs Administration, Annual Customs Statistics, 1992-96.

Table 28--China and U.S. fruit production compared, 1995

Item	China		United States	
	1,000 tons	Percent	1,000 tons	Percent
Apples	14,011	33.2	4,870	16.7
Citrus	8,222	19.5	14,333	49.1
Pears	4,942	11.7	860	2.9
Bananas	3,125	7.4	6	0.0
Grapes	1,742	4.1	5,358	18.4
Pineapples	539	1.3	313	1.1
Dates	782	1.9	20	0.1
Persimmons	969	2.3	na	na
Other	7,814	18.5	3,404	11.7
Total	42,146	100.0	29,191	100.0

Sources: China Agricultural Yearbooks, 1995-96; and Fruit and Tree Nuts Situation and Outlook Yearbook, ERS, Oct. 1996.

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Table 29--China's processed fruit products, 1992-94

Item	1992	1993	1994
	Metric tons		
Candied fruit	39,034	39,027	28,900
Jam	11,520	11,529	NA
Canned fruit	78,323	69,668	85,000
Juice	160,000	200,000	230,000

Source: China Commerce Yearbook, various years.

Table 30--China and U.S. nut production compared, 1995

Item	China		United States	
	1,000 tons	Percent	1,000 tons	Percent
Walnuts	230	na	212	33.8
Chestnuts	218	na	na	na
Cashews	1	na	na	na
Macadamia	na	na	168	3.7
Almonds	na	na	35	26.8
Pistachio	na	na	23	10.7
Hazelnuts	na	na	67	5.6
Pecans	na	na	122	19.4
Total	na	na	627	100

Sources: China Agricultural Yearbook, 1996; and Fruit and Tree Nuts Situation and Outlook Yearbook, ERS, Oct. 1996.

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Table 31--U.S. horticultural exports to China, 1994-96

Commodity	Quantity (tons)			Value (1,000\$US)		
	1994	1995	1996	1994	1995	1996
Fruit and preparations	992	3,018	1,063	802	2,550	1,022
Fruit juices	3,574	19,906	11,300	184	799	492
Nuts and preparations	2,901	123	1,284	4,092	371	2,314
Vegetables and preparations	--	--	--	3,135	4,811	12,191
Tea	2	7	11	9	46	66
Nursery and flowers	--	--	--	268	253	209
Spices	16	30	44	18	108	102
Total	--	--	--	8,508	8,938	16,396

Source: USDA FATUS database.

Table 32--U.S. horticultural imports from China, 1994-96

Commodity	Quantity (tons)			Value (1000\$US)		
	1994	1995	1996	1994	1995	1996
Fruit and preparations	23,973	16,975	37,629	20,216	18,206	43,229
Fruit juices	53,503	86,065	171,842	1,223	3,049	8,229
Nuts and preparations	5,645	4,338	5,782	16,334	12,783	20,454
Vegetables and preparations	na	na	na	na	106,797	135,981
Tea and Coffee	35,730	23,064	24,125	33,045	29,748	36,247
Nursery, flowers	na	na	na	8,802	9,205	20,931
Spices	11,313	12,259	7,591	22,514	24,374	24,612
Total	na	na	na	208,931	233,070	294,730

Source: USDA FATUS database.

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Appendix table 1--China's grain area, yield, and production, 1991-96 1/

Item	1991	1992	1993	1994	1995	1996
Million hectares						
Sown area						
Wheat	30.95	30.50	30.24	28.98	28.81	29.61
Rice	32.59	32.09	30.36	30.17	30.70	31.41
Coarse grains	27.21	26.28	25.76	26.09	27.33	29.08
Corn	21.57	21.04	20.69	21.15	22.77	24.50
Sorghum	1.39	1.30	1.34	1.37	1.22	1.28
Millet	2.08	1.87	1.83	1.67	1.52	1.45
Barley	1.62	1.53	1.36	1.40	1.28	1.30
Oats	0.55	0.54	0.54	0.50	0.54	0.55
Potatoes	9.08	9.06	9.22	9.27	9.52	9.80
Others 2/	12.48	12.63	14.93	15.03	13.51	12.46
Total 3/	112.31	110.56	110.51	109.54	109.87	112.36
Tons/hectare						
Yield 4/						
Wheat	3.10	3.33	3.52	3.43	3.54	3.73
Rice	5.64	5.80	5.85	5.83	6.03	6.21
Coarse grains	4.13	4.16	4.55	4.38	4.56	4.85
Corn	4.58	4.53	4.96	4.69	4.92	5.20
Sorghum	3.55	3.65	4.11	4.60	3.90	4.44
Millet	1.62	2.07	2.19	2.22	1.99	2.28
Barley	2.85	3.05	3.18	3.15	3.20	3.08
Oats	1.18	1.19	1.19	1.20	1.19	1.18
Potatoes	2.99	3.14	3.45	3.26	3.37	3.06
Others 2/	1.28	1.35	1.56	1.69	1.68	1.08
Total 3/	3.88	4.00	4.13	4.06	4.25	4.36
Million tons						
Production						
Wheat	96.00	101.59	106.39	99.30	102.00	110.31
Rice	183.81	186.22	177.70	175.93	185.21	195.10
Coarse grains	112.33	109.31	117.18	114.29	124.51	141.10
Corn	98.77	95.38	102.70	99.28	112.00	127.47
Sorghum	4.93	4.74	5.51	6.30	4.76	5.68
Millet	3.36	3.88	4.00	3.70	3.02	3.30
Barley	4.62	4.67	4.33	4.41	4.09	4.00
Oats	0.65	0.64	0.64	0.60	0.64	0.65
Potatoes 5/	27.16	28.44	31.81	30.25	32.12	30.00
Others 2/	15.99	17.10	23.36	25.33	22.73	13.49
Total 3/	435.29	442.66	456.44	445.10	466.57	490.00

1/ Data are official figures released by the SSB or the Ministry of Agriculture, except for 1996 individual coarse grains, potatoes, and other grains.

2/ Consists of soybeans, pulses, and other miscellaneous grains. All of these items are included in China's definition of total grains.

3/ PRC definition.

4/ Calculated from area and production figures.

5/ Converted to a grain-equivalent weight using a 5:1-conversion ratio.

Sources: China Agriculture Yearbook, 1989-96; China Statistical Yearbook, 1989-96; and China Statistics Abstract, 1997.

Appendix table 2--China's 1996 provincial grain, cotton, oilseed, sugar crop, and red meat production

Province	Grain 1/	Cotton	Oilseed crops	Sugar crops	Red meat
1,000 metric tons					
Northeast					
Heilongjiang	25,194	--	1,680	4,919	1,319
Liaoning	15,758	11	170	586	1,904
Jilin	22,119	--	217	702	1,309
North					
Shandong	38,360	372	3,093	16	4,294
Hebei	25,571	258	1,207	69	2,876
Beijing	2,318	3	29	--	276
Tianjin	1,992	5	31	--	178
Henan	34,333	736	2,785	205	3,714
Shanxi	9,342	72	373	660	661
Northwest					
Shaanxi	10,492	31	374	27	755
Gansu	6,908	26	431	1,191	628
Nei Monggol	13,017	--	814	3,207	921
Ningxia	2,356	--	79	465	110
Xinjiang	7,897	940	340	3,545	525
Qinghai	971	--	171	--	185
East					
Zhejiang	14,060	68	521	639	1,009
Jiangsu	3,301	54	1,475	229	2,280
Shanghai	2,224	4	162	67	283
Anhui	23,723	270	1,772	184	1,949
Central					
Hubei	22,887	430	1,818	856	2,760
Hunan	25,402	190	1,181	1,292	3,665
Jiangxi	16,641	123	1,010	1,858	1,955
South					
Guangdong	16,073	--	742	15,231	2,097
Guangxi	14,167	1	516	28,305	2,407
Fujian	7,778	--	230	2,539	1,172
Hainan	1,594	--	80	3,293	228
Southwest					
Sichuan	37,143	123	1,568	1,727	5,785
Guizhou	8,381	1	556	357	1,035
Yunnan	10,833	1	188	11,434	1,359
Xizang	--	--	--	--	119
Total	450,543	4,203	22,071	83,602	47,722

1/ This is the fourth year in which this publication lists "grains" (guwu) instead of "food grain" (liangshi). The narrowly defined "grain" (guwu) seems to exclude soybeans, potatoes, and other grains. Therefore, the provincial grain data in this table are not directly comparable with tables from previous years.

Source: 1997 China Statistics Abstract. This is the fourth year in which this publication

Appendix table 3--China's oilseeds and cotton area, yield, and production, 1990-96

Item	1990	1991	1992	1993	1994	1995	1996
<hr/>							
Sown area:	1,000 hectares						
Cotton	5,588	6,539	6,835	5,000	5,530	5,422	4,722
Oilseeds, USDA 1/	22,272	23,382	23,825	23,857	25,118	25,078	23,760
Soybeans	7,560	7,041	7,221	9,454	9,222	8,127	7,800
Oilseeds, PRC 2/	10,901	11,569	11,499	11,143	12,089	13,101	12,537
Peanuts	2,907	2,880	2,986	3,380	3,778	3,809	3,770
Rapeseed	5,504	6,133	5,976	5,300	5,783	6,907	6,670
Sesameseed	669	680	746	753	690	642	594
Sunflowerseed	713	789	807	723	805	813	820
Other oilseeds 3/	1,108	1,087	984	987	1,033	930	683
<hr/>							
Yield:	Kg/hectare						
Cotton	807	869	659	749	783	879	890
Oilseeds, USDA 1/	1,496	1,477	1,387	1,618	1,682	1,722	1,753
Cottonseed	1,372	1,477	1,121	1,332	1,393	1,557	1,601
Soybeans	1,455	1,379	1,426	1,619	1,735	1,661	1,731
Oilseeds, PRC 2/	1,480	1,416	1,427	1,619	1,646	1,718	1,760
Peanuts	2,191	2,188	1,994	2,491	2,563	2,678	2,690
Rapeseed	1,264	1,212	1,281	1,309	1,296	1,416	1,375
Sesameseed	701	640	692	748	794	908	na
Sunflowerseed	1,878	1,800	1,824	1,773	1,702	1,562	na
Other oilseeds 3/	901	729	831	845	778	ERR	na
<hr/>							
Production:	1,000 tons						
Cotton 4/	4,507	5,683	4,507	3,745	4,333	4,768	4,202
Cotton (1,000 bales) 4/	20,700	26,100	20,700	17,200	19,900	21,900	19,300
Oilseeds, USDA 1/	33,330	34,526	33,038	38,610	42,248	43,187	41,660
Cottonseed	7,665	9,660	7,660	6,658	7,704	8,440	7,560
Soybeans	11,000	9,710	10,300	15,310	16,000	13,500	13,500
Oilseeds, PRC 2/	16,132	16,383	16,412	18,039	19,896	22,503	22,071
Peanuts	6,368	6,300	5,953	8,420	9,682	10,200	10,140
Rapeseed	6,958	7,436	7,653	6,940	7,492	9,777	9,170
Sesameseed	469	435	516	563	548	583	na
Sunflowerseeds	1,339	1,420	1,472	1,282	1,370	1,270	1,290
Other oilseeds 3/	998	792	818	834	804	673	na
<hr/>							
Edible vegetable oil 5/	4,454	4,868	4,813	5,264	5,964	6,653	6,605
Available meal 5/	11,915	12,618	12,825	15,057	16,755	17,759	18,181

1/ Source: USDA PS&D database. Total oilseeds include soybeans, cottonseed, peanuts, rapeseed, and sunflowerseed. Area includes cotton.

2/ Source: China Statistical Yearbook, 1991-96. Total oilseeds exclude soybeans and cottonseed, but include other oilseeds.

3/ "Other oilseeds" are calculated as a residual and include mainly huma (an edible oil-bearing flaxseed) and castor beans; oil-bearing tree seeds are excluded.

4/ Cotton production is on a ginned-weight basis. 1 ton equals 4.592917 bales, and 1 bale equals 480 lbs.

5/ "Edible vegetable oil" and "Available meal" data come from the USDA PS&D database. Edible vegetable oil includes soyoil, cottonseed oil, peanut oil, rapeseed oil, and sunflowerseed oil.

Appendix table 4--China's yearend livestock inventory and product output, 1990-96 1/

Animal or Product	1990	1991	1992	1993	1994	1995	1996
<hr/>							
Yearend inventory:	Million head						
Hogs	362	370	384	393	415	442	457
Large animals	130	132	135	140	149	159	167
Draft animals	76	77	78	81	85	88	91
Cattle	103	105	108	113	123	132	140
Dairy cows	3	3	3	3	4	4	na
Water buffalo	22	22	22	23	23	24	na
Horses	10	10	10	10	10	10	10
Mules	5	6	6	5	6	5	5
Donkeys	11	11	11	11	11	11	11
Camels	0	0	0	0	0	0	0
Sheep	113	111	110	112	117	127	133
Goats	97	95	98	106	123	150	171
Poultry 2/	2,900	3,250	na	na	3,740	4,109	na
<hr/>							
Number slaughtered:	Million head						
Hogs	310	329	352	378	421	480	527
Cattle	11	13	15	19	25	30	na
Sheep and goats	89	98	103	112	131	165	na
Poultry 2,4/	2,392	2,824	3,193	3,978	5,128	6,302	na
<hr/>							
Slaughter rate: 3/	Percent						
Hogs	88	91	95	98	107	116	119
Cattle	11	13	15	18	22	25	na
Sheep and goats	42	47	50	54	60	69	na
Poultry 2,4/	105	113	110	122	150	176	na
<hr/>							
Production:	1,000 tons						
Red meat	25,135	27,238	29,406	32,253	36,927	42,653	47,721
Pork	22,811	24,523	26,353	28,544	32,048	36,484	40,375
Beef	1,256	1,535	1,803	2,336	3,270	4,154	4,946
Mutton	1,068	1,180	1,250	1,373	1,609	2,015	2,400
Poultry meat	3,229	3,950	4,542	5,736	7,552	9,347	na
Total milk	4,751	5,243	5,639	5,637	6,089	6,728	na
Cow's milk	4,157	4,644	5,031	4,987	5,288	5,764	6,158
Sheep and goat's milk	594	599	608	650	801	964	na
Sheep's wool	239	240	238	240	255	277	na
Mohair	17	16	17	19	25	30	na
Cashmere	6	6	6	6	7	8	na
Eggs	7,946	9,220	10,199	11,798	14,790	16,767	18,681

na = not available

1/ All data are official data from China's State Statistical Bureau or China's Ministry of Agriculture.

2/ Poultry includes chickens, ducks, and geese.

3/ Slaughter rate is slaughter divided by beginning inventory.

4/ Data for 1991 are estimates—not official China or USDA data.

Sources: China Statistical Yearbook, 1991-96; China Agricultural Yearbook, 1991-96; and China Statistics Abstract, 1997.

Appendix table 5--China's major agricultural exports, by volume, 1991-96

Item	Units	1991	1992	1993	1994	1995	1996
Swine, live	1,000 head	2,850	2,900	2,720	2,700	2,530	2,400
Poultry, live	1,000 head	47,520	51,770	51,270	52,300	52,630	53,770
Beef, fresh or frozen	Tons	132,040	30,000	20,000	20,000	20,000	30,000
Pork, fresh or frozen	Tons	116,635	50,000	60,000	100,000	150,000	130,000
Broiler, frozen	Tons	45,395	11,630	94,454	164,288	248,573	298,509
Rabbit meat, frozen	Tons	11,742	17,330	23,051	26,587	47,647	24,113
Eggs	Million pieces	605	635	425	486	358	520
Food grains	1,000 tons	10,860	12,020	13,270	11,040	640	1,240
Rice	1,000 tons	690	950	1,430	1,520	50	260
Corn (maize)	1,000 tons	7,780	10,310	11,100	8,740	110	160
Soybeans	1,000 tons	1,110	660	370	830	380	190
Fruit	Tons	163,563	na	na	na	na	na
Oranges	Tons	43,414	61,392	81,047	127,428	131,798	150,897
Apples	Tons	24,082	38,317	119,419	107,170	108,956	164,976
Walnuts, in shell	Tons	4,992	na	na	na	na	na
Walnut meat	Tons	8,245	9,841	17,384	10,839	9,255	13,217
Chestnuts	Tons	33,939	29,138	38,399	37,680	36,117	32,015
Sugar	Tons	343,315	1,670,019	1,853,257	946,549	480,425	664,783
Natural honey	Tons	69,958	91,745	96,538	102,102	86,991	83,461
Tea	Tons	184,872	175,525	201,435	179,679	166,572	169,662
Canned food	Tons	657,660	na	na	na	na	na
Pork	Tons	128,409	53,075	71,511	69,302	63,822	41,593
Vegetables	Tons	340,265	na	na	na	na	169,300
Fruit	Tons	99,102	na	na	na	na	na
Beer	1,000 liters	43,634	57,140	84,210	110,220	130,910	66,620
Flue-cured tobacco	Tons	60,937	47,850	58,676	59,020	56,570	51,705
Goatskin	1,000 pieces	2,410	310	14	na	na	na
Furskin, raw	1,000 pieces	1,620	980	2,150	na	na	na
Mink skin	1,000 pieces	850	620	1,280	na	na	na
Raw silk	Tons	7,919	8,899	8,664	13,049	12,710	12,101
Cotton	Tons	199,980	144,620	149,953	108,147	21,619	4,493
Cashmere	Tons	2,020	na	na	na	na	na
Rabbit hair	Tons	6,419	5,686	5,733	10,677	4,395	3,986
Oilseeds, edible	Tons	572,231	630,000	1,000,000	1,490,000	910,000	690,000
Peanuts, shelled and unshelled	Tons	427,640	300,000	320,000	480,000	390,000	350,000
Vegetable oil	Tons	99,334	67,846	136,095	270,267	516,748	473,465
Cotton yarn	Tons	187,035	162,945	198,714	194,877	179,895	142,033

na = not available.

Source: China's Customs Statistics, 1991-96.

Appendix table 6--China's major agricultural exports, by value, 1991-96

Item	1991	1992	1993	1994	1995	1996
1,000\$US						
Swine, live	276,350	289,560	271,480	268,503	277,711	291,468
Poultry, live	82,040	93,340	90,340	105,446	125,344	120,617
Beef, fresh or frozen	203,850	38,850	27,850	30,813	33,907	51,240
Pork, fresh or frozen	185,660	76,420	62,670	128,376	245,347	214,863
Broilers, frozen	95,840	22,500	166,240	343,236	556,557	631,211
Rabbit meat, frozen	26,110	46,890	33,690	39,517	47,647	64,617
Eggs	27,820	24,470	15,420	18,080	16,666	25,315
Food grains	1,581,440	1,546,590	1,515,300	1,572,503	136,744	367,341
Rice	151,830	217,850	252,760	514,608	16,237	111,521
Corn (maize)	864,470	1,219,750	1,153,990	944,258	13,233	30,269
Soybeans	262,210	159,630	101,950	222,443	99,674	66,183
Fruit	78,700	na	na	na	na	na
Oranges	22,600	32,430	37,850	54,224	55,696	62,076
Apples	9,790	20,360	47,960	41,134	45,300	69,144
Walnuts, in shell	4,970	na	na	na	na	na
Walnut meat	19,280	24,320	41,570	27,414	25,172	38,100
Chestnuts	63,100	49,510	78,450	79,899	77,310	66,120
Sugar	120,650	620,050	596,220	321,372	187,096	247,794
Natural honey	61,390	80,060	70,200	75,016	87,484	110,655
Tea	376,060	361,890	355,680	294,339	274,748	282,500
Canned food	787,900	na	na	na	na	na
Pork	193,470	83,980	113,220	110,477	118,528	72,473
Vegetable	364,160	na	na	na	na	na
Fruit	76,670	na	na	na	na	na
Beer	25,920	31,900	41,640	41,118	53,084	31,791
Flue-cured tobacco	118,040	105,030	103,150	72,401	77,322	90,267
Goatskin	8,370	1,560	54	229	--	168
Furskin, raw	15,400	7,490	11,790	3,822	2,871	4,792
Mink skin	11,050	4,360	6,210	1,284	979	293
Raw silk	336,580	278,660	188,420	295,315	300,548	265,272
Cotton	360,960	210,590	190,070	149,102	46,800	12,482
Cashmere	163,860	na	na	na	na	na
Rabbit hair	105,220	110,250	110,250	136,963	71,088	67,544
Oilseeds, edible	448,470	279,600	407,350	635,318	494,270	452,431
Peanuts, shelled						
and unshelled	360,270	190,320	196,180	315,022	256,865	254,437
Vegetable oil	76,520	45,950	89,930	208,569	406,590	318,594
Cotton yarn	459,850	391,210	416,270	514,377	576,313	458,512

na = not available. - = negligible.

Source: China's Customs Statistics, 1991-96.

Appendix table 7--China's major agricultural imports, by volume, 1991-96

		1991	1992	1993	1994	1995	1996
Food grains	1,000 tons	13,450	11,620	7,330	9,040	20,400	10,830
Wheat	1,000 tons	12,370	10,580	6,420	7,180	11,590	8,250
Barley	1,000 tons	751,910	828,891	na	510	na	na
Rice	1,000 tons	140	100	100	0	1,640	760
Corn (maize)	1,000 tons	--	--	--	30	5,180	440
Dried beans	1,000 tons	20	30	na	na	na	na
Soybeans	1,000 tons	--	121	na	na	294	1,108
Sugar	Tons	1,013,763	1,100,000	450,000	1,550,000	2,950,000	1,250,000
Coffee & coffee beans	Tons	1,933	3,289	na	na	na	na
Cocoa beans	Tons	30,262	516	na	na	na	na
Natural rubber	Tons	306,161	270,000	270,000	340,000	320,000	550,000
Synthetic rubber	Tons	84,252	148,199	169,016	250,809	311,024	367,456
Logs	1,000 cubic meters	3,790	4,670	3,470	3,330	2,580	3,190
Cotton	Tons	370,524	280,000	10,000	500,000	740,000	650,000
Wool	Tons	106,243	208,995	237,459	319,086	283,668	226,213
Animal oil & fats	Tons	80,012	71,338	na	na	na	na
Edible vegetable oil	Tons	611,887	420,000	240,000	1,630,000	3,530,000	2,640,000
Other vegetable oil	Tons	1,091,734	650,000	840,000	1,580,000	200,000	120,000
Fertilizer, manufactured	1,000 Tons	18,175	18,590	10,210	12,660	19,910	18,570
Ammonia sulphate	Tons	253,203	54,746	na	na	na	na
Urea	Tons	7,005,128	7,480,000	3,610,000	3,130,000	6,960,000	6,010,000
Superphosphates	Tons	202,542	215,973	na	na	na	na
Potassium chloride	Tons	2,432,214	2,440,000	570,000	2,850,000	3,860,000	3,440,000
Compound fertilizer	Tons	7,033,791	6,540,000	3,560,000	5,140,000	7,300,000	7,210,000
Pesticides	Tons	31,211	39,304	24,061	31,830	34,712	32,111

na = not available. -- = negligible.

Source: China's Customs Statistics, 1991-96.

Appendix table 8--China's major agricultural imports, by value, 1991-96

Item	1991	1992	1993	1994	1995	1996
U.S. \$1,000						
Food grain	1,642,740	1,705,020	1,004,920	1,272,574	3,607,139	2,575,328
Wheat	1,459,540	1,503,730	834,080	942,527	2,026,390	1,890,369
Barley	110,236	134,258	na	na	na	
Rice	39,840	39,050	34,970	141,488	433,551	286,467
Corn (maize)	130	100	180	179	816,077	73,056
Dried beans	6,750	8,206	na	na	na	na
Soybeans	260	28	na	na	na	na
Sugar	256,270	255,300	110,940	407,859	897,581	393,088
Coffee and coffee beans	6,770	4,738	na	na	na	na
Cocoa beans	34,840	942	na	na	na	na
Natural rubber	261,240	230,830	219,800	330,910	422,070	720,255
Synthetic rubber	127,970	176,090	198,050	251,057	327,100	396,851
Logs	454,310	495,540	459,130	430,372	368,372	457,780
Cotton	630,650	429,780	15,980	880,147	1,377,819	1,196,219
Wool	350,480	774,060	701,260	793,797	944,137	851,146
Animal oil and fats	29,150	25,713	na	na	na	na
Edible vegetable oils	289,090	195,010	118,290	986,339	2,315,548	1,493,042
Other vegetable oils	401,140	258,850	338,210	757,955	116,004	78,199
Fertilizer (manufactured)	3,229,490	3,003,700	1,479,150	1,938,248	3,741,502	3,563,239
Ammonia sulphate	16,780	3,775	na	na	na	na
Urea	1,216,430	1,148,320	457,650	423,096	1,426,975	1,242,021
Superphosphates	32,860	37,626	na	na	na	na
Potassium chloride	294,242	279,820	130,050	306,192	437,795	386,648
Compound fertilizer	148,187	1,244,570	594,570	972,019	1,616,783	1,660,673
Pesticides	183,144	203,650	122,360	137,198	159,743	137,547

na = not available.

Source: China's Customs Statistics, 1991-96.

Appendix table 9--U.S. agricultural exports to China, FY 1991/92-1994/95 and CY 1992-96 1/

Item	Fiscal Year (FY)				Calendar Year (CY)				
	1991/92	1992/93	1993/94	1994/95	1992	1993	1994	1995	1996
1,000 tons									
Wheat	4,226	2,187	2,357	3,823	2,982	2,717	1,913	3,649	2,267
Corn	0	0	0	3,989	0	0	36	5,357	108
Tobacco	0	0	0	--	0	1	1	162	54
Cattle hides, whole 2/	162	163	582	1,332	127	207	709	1,564	1,719
Soybeans	136	61	70	0	136	98	33	199	1,495
Cotton	172	--	304	471	133	--	401	466	416
Vegetable oils	21	2	99	603	20	1	225	549	212
1,000\$US									
Wheat	369,727	238,252	203,504	510,845	272,951	278,391	166,228	499,791	437,326
Corn	0	0	0	454,176	0	0	3,510	629,253	13,815
Tobacco	0	0	0	767	0	0	0	767	250
Cattle hides, whole	7,341	8,216	31,386	77,721	6,240	10,370	40,082	87,590	91,569
Soybeans	29,682	13,931	17,714	0	29,682	22,999	8,645	50,657	414,476
Cotton	240,643	158	496,552	805,818	185,943	179	644,986	828,811	727,497
Vegetable oils	9,161	1,454	56,900	392,760	7,880	270	132,715	358,633	111,199
Others	34,368	60,041	71,215	370,968	41,164	63,791	84,208	177,498	295,868
Million\$US									
Total agriculture	691	376	877	2,413	545	376	1,080	2,633	2,092
Total nonagriculture	6,188	8,763	5,516	7,802	6,794	8,243	8,207	7,802	9,886
Total	6,879	8,564	10,367	10,215	7,339	8,619	9,287	10,435	11,978

na = not available. -- = negligible.

1/ U.S. domestic exports, f.a.s.-value basis. Exports include agricultural product transshipments through Canada.

2/ Numbers in thousands.

Sources: U.S. Bureau of the Census, U.S. export data; and USDA FATUS database.

Appendix table 10--Major CY U.S. agricultural imports from China, 1991-96 1/

Item	1991	1992	1993	1994	1995	1996
	1,000\$US					
Meats & products, excluding poultry	239	1,064	1,439	524	1,234	1,155
Other meats, fresh or frozen	237	1,034	1,389	463	1,183	1,135
Poultry and products	43,691	45,191	34,508	47,740	62,923	57,523
Eggs	241	1,280	2,274	2,055	2,860	2,808
Feathers and down, crude	43,385	43,856	32,201	45,320	60,030	54,682
Hides and skins	695	481	223	276	115	114
Furskins	351	248	83	50	42	43
Wool, unmanufactured, apparel	1,017	773	4,129	1,833	2,988	4,177
Sausage casings	6,845	9,653	10,088	11,012	9,208	11,723
Silk, raw	5,420	2,439	1,403	1,875	1,188	3,043
All other animal products	11,103	13,278	9,519	10,737	16,239	17,689
Grains and feeds	8,760	10,556	13,325	20,965	24,972	27,916
Fruits and preparations	14,239	28,978	21,196	20,216	18,206	43,229
Fruits, prepared or preserved	14,122	28,787	21,075	19,904	18,054	43,090
Nuts and preparations	7,176	12,734	21,719	16,334	12,783	20,454
Vegetables and preparations	85,936	78,592	102,726	106,797	135,981	141,028
Vegetables, prepared or preserved	75,295	63,019	75,587	84,296	119,250	125,969
Mushrooms, canned	24,554	21,130	20,734	27,294	62,151	50,581
Water chestnuts	17,327	15,799	17,949	18,864	16,075	29,509
Sugar and related products	19,011	26,874	29,612	26,307	18,001	35,681
Spices	2,660	5,243	6,248	6,763	5,010	4,765
Beverages	7,437	7,077	7,411	5,041	7,193	6,684
Cocoa and products	13,545	20,685	30,554	26,200	25,710	37,248
Tea	25,837	29,035	29,956	31,835	28,451	36,236
Malt beverages	6,588	5,908	6,680	4,335	6,109	4,782
Oilseeds and products	3,054	3,447	4,664	4,166	3,183	8,935
Oilseeds and oilnuts	1,643	1,986	2,059	1,217	858	1,963
Oils and waxes, vegetable	1,380	1,441	2,579	2,873	2,259	6,783
Seeds, field and garden	14,722	11,125	11,776	14,858	16,925	23,027
Essential oils	18,095	21,724	20,217	24,956	28,841	20,900
Drugs, crude natural	11,559	14,539	24,721	18,840	17,312	30,497
All other vegetable products	5,303	7,425	7,490	6,835	7,465	14,364
Total agricultural commodities	327,930	378,776	450,851	440,261	479,240	596,760
Total nonagricultural commodities	18,527,111	25,135,552	30,974,515	38,340,739	45,075,760	50,898,540
Total imports	18,855,041	25,514,328	31,425,366	38,781,000	45,555,000	51,495,300

1/ Imports for consumption, customs-value basis.

Sources: U.S. Bureau of Census, U.S. Imports statistics; and USDA FATUS database.

Appendix table 11--China's other agricultural output, 1990-96

Items	1990	1991	1992	1993	1994	1995	1996
1,000 tons							
Sugar crops	72,145	84,187	88,080	76,240	73,452	79,401	83,599
Sugarcane	57,620	67,898	73,011	64,194	60,926	65,417	66,873
Sugarbeets	14,525	16,289	15,069	12,048	12,526	13,984	16,726
Tobacco	2,627	3,031	3,499	3,451	2,238	na	na
Flue-cured	2,259	2,670	3,119	3,036	1,940	2,072	2,946
Tea	540	542	560	600	588	588	593
Jute and hemp 1/	726	513	619	672	354	371	365
Silk cocoons	534	584	660	756	844	760	508
Aquatic products	12,370	13,510	15,570	18,230	21,430	25,250	30,850
Rubber	264	296	309	326	374	424	425
Fruit	18,744	21,761	24,400	30,112	34,992	42,114	46,523

na = not available.

1/ Hemp data on a processed basis (conversion is 2 kg raw equals 1 kg processed).

Sources: China Statistical Yearbook, 1991-96; and China Statistics Abstract, 1997.

**Appendix table 12--China's
average \$U.S. exchange
rate, 1987-96**

Year	Average exchange rate
RMB/\$US	
1987	3.7221
1988	3.7221
1989	3.7651
1990	4.7832
1991	5.3234
1992	5.5146
1993	5.7620
1994	8.6200
1995	8.3000
1996	8.2200

Source: IMF International
Financial Statistics, various
issues.



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